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Notes and News.

Kimberley Engineers' Visit. Quite the event of the week in engineering circles has been the visit of the Kimberley members of South African Institution of Engineers to the Rand. Their all too brief stay amongst us will be brought to its close and climax to-night by the annual dinner of the Institution, always an interesting and important social occasion, and to be rendered memorable this year by the presence of the Kimberley engineers and of a contingent of officers from H.M.S. New Zealand. The visitors from Kimberley were shown over several of our biggest engineering undertakings in the past few days, and have amply repaid their hosts and guides by the expert interest evinced in the many illustrations of engineering progress which the Rand can boast. Though a little late in the day, we would like to join in bidding a hearty welcome to the visitors.

* * * *

E.R.P.M. Annual Report. The annual report of the E.R.P.M. has been completed for some weeks and will be issued simultaneously to shareholders from the London and Johannesburg offices next Monday. The day of issue, unfortunately, makes it impossible for us to give any extracts; but a detailed review of the whole will appear in our next issue. It is enough to state here that the document is a very satisfactory one, without any sensational features.

* * * *

New Explosives. The inventive talent of Southern Rhodesia and the Congo Free State appears to be much exercised in regard to new explosives at the moment. It is claimed that an Elizabethville inventor is arranging a syndicate to manufacture a new kind of explosive in the Katanga, whilst the *Glasgow Herald* learns that a syndicate is being formed to exploit a new explosive which, the inventor claims, will make great economies in mining, and eventually come into use throughout the world where mining is carried on. No public issue will be made, as the money required, about £100,000, is being raised privately. The inventor is an old English settler in Rhodesia, one of the first pioneers of Bulawayo, who went out when that town was only a place of tents and boundless aspirations. When the syndicate has been formed, the inventor intends to return to South Africa, where a second factory is to be established.

* * * *

Brakpan's New Plant. Orders for forty additional stamps for the Brakpan Mines have been placed, and the new heads should be running about the end of this year. In the first instance they will be used as an alternative to tube mills. The increase in stamping capacity is in keeping with the original intentions of the company, ore bins for the full 200 stamps are in place, and the extension of the mill will be effected at very little cost. In addition to these new stamps, two more tube mills will be installed in about two months' time, thus bringing the total number of these fine grinding machines up to ten. As development of the mine proceeds, and should the position generally warrant such a step, the tonnage milled will gradually be increased, and eventually one million tons per annum will, in all probability, be put through the mill.

* * * *

Springs Mines: North Shaft Close on the Reef. Up to the time of going to press reef had not been encountered in the North Shaft of the Springs Mines, Ltd., but it is expected that intersection will be effected very shortly, as it is probable that the reef is not now 100 feet away. It may be recalled that some few weeks ago it was announced that it had been ascertained that the original estimate as to the depth at which reef would be intersected in the Springs Mines property would be exceeded, owing to reverse faulting which produced a downthrow of the strata estimated at about 275 feet. During the quarter ended with December last the North Shaft was sunk 353 feet to a total depth of 3,110 feet, and the south shaft to 2,850 feet. In the North Shaft the Bird Reef and " Modderfontein Series " were in turn passed through at depths of 2,858 and 2,979 feet respectively. The remaining depth to the reef was, according to the company's officials, " in the nature of things impossible of exact calculation, but if normal conditions prevail the reef should be cut at about 3,450 feet, and the date of intersection should be early in March."

* * * *

Mashonaland Copper.

Something in the nature of a revival of interest in the copper fields of the Lomagundi district of Mashonaland is to be observed in Southern Rhodesia. This area contains the Alaska Mine, famous for its extensive, ancient workings, which was closed down some years ago. We learn that 30 tons of copper ore from a property named the Norman, in the vicinity of the Eldorado Mine, are awaiting shipment. When the Falcon Mine commences production in a few months' time, further attention and capital will doubtless be attracted, and Southern Rhodesia may yet build up a copper mining industry of considerable importance.

* * * *

Katanga Tin.

The southern portion of the Congo Free State, apart from its great possibilities of copper production, is a producer of another base metal—tin—and a prospective producer of considerable importance of this metal. The s.s. Elizabethville, which arrived at Antwerp in mail week, carried the first Katanga tin shipment. The tin weighed about 350 kilogrammes, and came from the tin fields of Muika, discovered and worked by the Recherches Minières du Bas Katanga (still called the Bakat or the Thys-Jadot Syndicate). It may be recalled that Mr. Frecheville, in the report he made for the Tanganyika Concessions Company about six years ago, referred at some length to the Katanga tin deposits—particularly to those in the Busanga area.

* * * *

New Heriot.

The annual meeting was held last week of the New Heriot Mining Company, at Pietermaritzburg, Mr. Hugh Parker presiding. The Chairman said the profits last year, including gold reserve, were £111,415 7s. 7d., a decrease of £2,664 17s. 2d. on the previous year. The usual dividend of 40 per cent., amounting to £92,000, had been declared. The grade of ore had yielded an increased revenue, but the working costs had increased, and the tonnage milled showed a decrease of 7,000. The large compressor broke down, and had to be replaced at considerable cost. The mine had experienced the need of more labour. There had been particular difficulty in securing efficient hammer boys. The prospects of the mine were good, and given an adequate supply of labour there was no reason why the mine should not continue to give as good returns as in the past. The report was adopted.

* * * *

Proposed Colliery Amalgamation.

At the annual meeting of the St. George's Coal Company, last week, the Chairman (Mr. Otto Siedle) intimated that a provisional agreement had been entered into with the Dundee Coal Company for the amalgamation of the two companies, which would be submitted to an extraordinary meeting in the near future. He stated that the present mine had a palpable life of another six years, and it was found that the new property which they had purchased could be more satisfactorily worked in conjunction with the Dundee Company.

* * * *

City & Suburban.

The annual meeting of the City and Suburban Gold Mining Company was held at Pietermaritzburg last week. The Chairman, Mr. Hugh Parker, said the past year's operations had been very successful, considerably exceeding those of previous years. Whereas the profit for 1911 was £174,004 10s. 6d., last year it was £278,418 11s. 3d., including the gold reserve. The Board had been enabled to declare two half-yearly dividends of 6s. per share, amounting to £204,000, an increase of £51,000. The value of the ore had considerably increased, although the working costs were more. The new reduction plant had been a success. The conditions were so rapidly improving that phthisis was likely to become unknown in five years. Regarding the life of the mine, the Chairman said the Government engineer estimated the taxed profits for five years, but he (the Chairman) thought the life would be longer than that estimate. It was difficult to determine with accuracy the life of any main reef mine. He anticipated that last year's output would be equalled, if not exceeded, this year. The report was adopted.

* * * *

Natal Coal: Position and Prospects.

Mr. Otto Siedle, presiding at the annual meeting of the St. George's Coal Company, held at Durban last week, delivered an address on the present conditions of the Natal coal industry, and the various obstacles which had prevented greater outputs during the past year. Referring to the work of his company, Mr. Siedle called attention to the increase of 8,000 tons over the previous year's output. They were in a position to put out more coal had labour been available throughout the period, but under the new regulation which permitted the recruiting of labour the mines and other industries, as well as agriculture, had suffered. The farmers had suffered severely through the touting for labour for the goldfields. They had, continued the Chairman, a future in the coal industry of Natal, which depended a great deal on the assistance they got from the Government in the way of facilities. " We must," he said, " have the auxiliary line we have been asking for, and pressing to get for some years past." They would see an increase in business during the past year. Six years ago the output was half what it was now, but during the last two years the increase had been very small, not because it could not be put up, nor because of the labour (although that was a factor), but because they could not rely on railway facilities sufficiently to enter into contracts on big risks of freights, as they had to do, because the development of the trade lay in the direction of export. The output for the year had increased by 74,094 tons from 1911, or a total output of 2,470,773 tons. The Government had put into service during the year 609 trucks, and in December put on an additional 605, while at that time they had over 1,100 trucks on order. He understood that they were spending a million on fresh rolling stock, but it was not altogether a matter of additional rolling stock, for it only congested the line, which was already as full as it could be.

* * * *

Albu Mines in February.

The aggregate profit earned by the subsidiaries of the General Mining and Finance Corporation in February was £8,206 less than in January, the two figures reading: January, £66,262; February, £58,056. It should be taken into consideration that February was a short month, and, bearing this in mind, and also the facts that the Cinderella's operations were somewhat disorganised by a change of management, whilst the Roodepoort United Main Reef results were affected by the overwind at the end of January, which brought about a reduced tonnage, the result cannot be deemed unsatisfactory. At any rate, the aggregate earning is greater than that announced in respect of operations for the corresponding month of last year. It is noteworthy that the Meyer and Charlton records the excellent profit of £20,043 from only 13,041 tons crushed. We understand that this fine old property is looking exceedingly well at present. The output and profit declared for last month give an excellent and tangible indication of the great dividend-earning capabilities of the mine. The profits of the Van Ryn, £23,578; the New Goch, £6,646; and the Aurora West, £4,712, must all, too, be deemed thoroughly satisfactory.

Base Metals and Minerals.

The coal output of the Union for January was 725,306 tons, value £181,881, an increase on December of 42,564 tons, value £18,078. The Transvaal produced 397 tons of copper, and the Cape 1,535, whereof 1,211 tons, value £27,074, were shipped. The Transvaal shipped tin to the value of £34,517. The Cape produced 76 tons of asbestos, valued at £1,305. The Transvaal's output of lime was valued at £8,792, the Free State £840, and Natal £129. The silver output was of the value of £11,655.

* * * *

Rand Power Supply.

The great progress made by the two large power companies—the Victoria Falls and Transvaal Power Co.—on which so many of the gold mines now depend for their supply of motive power, was reviewed by Mr. Elkan at the meeting of the Chamber of Mines a few days ago. In 1907 the Victoria Falls and Transvaal Power Co. started by taking over the two then existing companies—the Rand Central Electric Works, with a plant capacity of 3,200 k.w., and the General Electric Power Co., which had a plant capacity of 2,500 k.w. or a total of 5,700 k.w. Towards the end of 1908 the new station of the Victoria Falls and Transvaal Power Co., at Brakpan, was started up and supplied 6,000 k.w., produced by two 3,000 k.w. turbines. In 1909-1910 this was augmented by the Simmer Pan Station with 3,000 k.w. turbines, so that by the end of 1910, 29,700 k.w. were being supplied, 24,000 k.w. of which constituted new supply. During 1911 and 1912 the Rosherville power station, owned by the Rand Mines Power Supply Co., was completed, consisting of five 10,000 k.w. turbines and six steam-driven turbo air compressors of a capacity of 3,500 k.w. each. The station at the Robinson Central Deep, consisting of six electrically-driven turbo air compressors of a capacity of 3,250 k.w. each, was also completed, and the advance made at the Vereeniging station allowed of two further 10,000 k.w. sets being brought into operation, so that the combined plants of the two power companies at the end of 1912 had a capacity represented by the following large figures: 94,000 k.w. electric plant; 10,500 k.w. air compressing plant. The following additional plant is on order and in course of erection: For the Victoria Falls and Transvaal Power Co., two 11,000 k.w. turbines, to be erected at Simmer Pan. For the Rand Mines Power Supply Co., two 12,000 k.w. turbines, to be erected at Vereeniging. One of the latter is almost ready to be placed in commission, while the other one is expected to be ready in June. Finally, three 7,000 k.w. steam-driven turbo air compressors will be erected at the Rosherville Station, and it is interesting to state that these will be the largest air compressors so far constructed. By the end of March next year, when the installation of all plant at present contemplated is anticipated to be completed, the combined capacity of all the power stations should be: 140,000 k.w. electric plant; 61,500 k.w. air compressing plant. These figures, it readily will be admitted, are enormous. Great credit is due to these power companies for their enterprise in initiating these works—calling for huge sums of money—to enable them to successfully cope with the large demands for power made by mines and other industries on these fields. "It can hardly have been expected by anybody," said Mr. Elkan, "that the bringing into operation of such enormous plants could have been achieved without any hitch, and that there have been breakdowns and other troubles only serves to bear out the experience gained in other parts of the world, where it has been shown long ago that such troubles are inseparable from bringing large units for the generation of electric power into commercial service. There can be but little doubt, however, that the reliability of the supply has improved and will continue to improve further year by year, and it is safe to assert that the supply of power in bulk has reduced capital outlay as well as working costs of the mining industry, besides proving of general benefit to the mines."

TOPICS OF THE WEEK.

THE OUTLOOK.

THE publication of the February returns from the Rand and the making of some important pronouncements by Cabinet Ministers at Capetown tempt us to indulge in one of our periodical stock-taking reviews of the situation. Moreover, conditions have been such of late as to encourage the croakings of the professional pessimist in our midst. The short answer to the croakers, of course, is that the inflow of capital having been stopped or restricted last year by labour troubles, some disappointing returns from developing mines and a fear of hasty Government legislation, business is now feeling the influence of that fact. That conditions in every direction are now on the mend hardly requires demonstration. The labour position has improved materially in several ways. The Government has dropped the worst of its ill-digested measures in connection with the industry; and in two notable speeches made this week by the Prime Minister and by General Smuts, its policy on the important questions of native labour and the Customs tariff has been shown to be without any terrors for nervous shareholders. Thus General Botha has put on record unequivocally his determination to resist any attacks on the existing native labour supply of the Rand; and General Smuts, if he means anything at all, has indicated his leaning to a tariff without tears for the inland consumer, that will extend further protection to industries by some form of direct bounty. These are two bright features of the week, from the Rand's point of view. The February returns, apart from those of the Roodepoort United and Cinderella Deep, may be regarded as most satisfactory for a short month. Where there are disappointments there are, in each case, a reason. Indeed, to quote from the notable speech delivered by Mr. Elkan last week, a scrutiny of the position of the gold mining industry cannot fail to leave the impression of great inherent soundness and strength upon every impartial investigator. In spite of the continued increase in the total tonnage crushed, the yield per ton has shown last year a distinct tendency to improve, the number of companies declaring dividends has increased, and when those companies which are developing their properties now have reached the producing stage, further increases may be expected. Though there is room for improvement, metallurgical practice has been brought to such a state of perfection that an appreciable increase in the extraction of gold is hardly feasible. It is probably no exaggeration to say that the average value of the residues to-day does not exceed 1s. 6d. per ton. Mr. Elkan stoutly maintains that a considerable improvement in the level of working costs can be obtained if conscientiously and single-heartedly striven for. His appeal to the Government has already borne good fruit. He admitted that the mines are a wasting asset, and that hay must be made while the sun shines—but he reminded those who proclaim these platitudes again and again that there is a limit even to the making of hay. We have but recently seen an instance of a mine being no longer able to work at a profit owing to the present high rate of costs; it therefore had to be closed down, with the consequence that the Government's hay-making days in that particular field are over—let the warning be taken in time, lest further similar instances should have to be recorded. Dealing liberally with the mining industry, declared Mr. Elkan, thereby enabling the development of fresh mining ventures to be taken in hand, will speedily bring its reward, direct as well as indirect; additional revenue will accrue to the Treasury, fresh outlets for their goods and produce will be created for the merchants and farmers, and new fields for the employment of labour will be found. In every direction a broadening and widening out of the mining industry is bound to redound to the benefit of the whole of South Africa, but such expansion can only be looked forward to if those on whom the mining industry has to rely for supplying it with the necessary funds to develop the hidden treasures have reasonable assurance that any funds thus invested will be given a fair opportunity of returning them such rewards as they are entitled to expect from a mining investment. Though Mr. Elkan disclaimed any intention to lay the blame at the door of the Government for the fact that during the year 1912 a very small amount of fresh capital was invested in South Africa for mining purposes, he most strongly urged the authorities not to discourage capitalists from venturing their money here, but, on the contrary, to do all in their power to facilitate its investment in this country, and they will surely have no cause to regret it. The mining possibilities of South Africa are still very great, very large areas remain unprospected, and in other areas valuable deposits have been discovered, which, owing to their situation and to the present-day cost of exploitation, cannot be worked at a profit, and thus lie dormant. Let it be all and everybody's endeavour to establish such conditions that an active forward policy can be pursued. Once European capitalists are frightened off, it is always a very difficult matter to re-establish confidence, and while in the first instance, no doubt, the mining industry would be the sufferer, the greatest sufferer in the long run would be South Africa as a whole. We make no apology for quoting Mr. Elkan's appeal, because we believe the measure of the whole prosperity of the country is based largely on the available supply of capital for its exploitation. No one need ever be tired or ashamed of preaching in this young, undeveloped country the wisdom of a right attitude on the part of the State and the people towards the outside investor, whose goodwill is one—and not the least important—of the factors in our prosperity. That the speeches made by responsible Ministers at Capetown this week favour such a statesmanlike attitude is one of the best auguries of the moment.

A PROMISING CONSTRUCTIVE PROPOSAL.

The address delivered by Mr. M. G. Elkan at the annual meeting of the Chamber of Mines last week contained at least one valuable constructive proposal, which, we hope, will evoke the serious consideration of the industry. Space last week did not permit of our giving extended notice to Mr. Elkan's remarks, though the fact was commented upon that Mr. William Cullen had in our own columns already mooted the idea. It will be remembered that Mr. Elkan declared that there was but one way of remedying existing labour troubles, and that was by effecting a decrease in the number of jobs underground filled by white men while increasing the number on the surface. If a policy framed on these lines can be carried out, Mr. Elkan thinks it will not only lead to a considerable decrease in working costs, but will also considerably enlarge the avenues for the employment of white men. This will become evident when it is recalled that in December last 38,985 natives were employed on the surface by the gold mines. As far as underground work is concerned the industry is confronted with the fact that many of its troubles are due to there being an insufficient number of white men available to do it, and just the reverse is the case on the surface. Here there is a surplus of skilled workmen, and in our midst there is growing up a population which, if it is to be retained in the country, as Mr. Elkan showed, must have work to enable it to live. Mr. Elkan holds that the position should be boldly tackled now. It appears possible, if only the white man will undertake to work here as he has to work in other countries, to do away with the bulk of the native labour on the surface and to replace it by white labour, always providing that the white man will do an honest day's work for a fair day's pay, and that he will clearly understand that he has got to be a workman and not an overseer. The scope for employment which will offer itself if such a policy is adopted need not be dilated upon. On the other hand, the state of affairs underground also needs remedying. Either the number of men available must be increased or the number of jobs reserved for them decreased to the extent that there are men of sufficient experience and ability ready to fill them. There is no hope of immigration to such an extent as to enable one to say there is a competent man available for every position open. The demand for miners all over the world is so great that everywhere the same difficulty has to be met more or less. Mr. Elkan asked the question: "Why should we in the Transvaal be forced to employ 'white men' when in other parts of the Union employers of labour may engage 'competent' men? It is not right, it is not equitable, and I have even got serious doubts whether the Act forcing us to do this is legal under our constitution." As Mr. Cullen pointed out in our own columns some time ago, some people look upon the native as an undisciplined savage, incapable of being more than a hewer of wood or a drawer of water. The general answer to that question is, of course, the miners' strike, which did not paralyse the industry as much as was expected. Of course we had the Chinese then, and this complicated the issue, but, generally speaking, the experience is that the native is capable of much more than is usually supposed. Many underground men know this full well. He responds to kindly treatment, is very amenable to discipline, is a quick learner, and dependable if shown with patience what is expected of him. In other words, could we not make much more use of the native underground than we do now? The adoption of the suggestion would, of course, mean comparatively high wages for a selected few natives and a reduction in the number of white men underground. Indeed, only the best men would be kept underground; they would run less risk from the dust. This arrangement should please everybody, for the inefficient miners, of whom we hear so much, would be eliminated, the good ones would all earn good money, and the natives, under the new conditions, might remain longer at their work than twelve months. We do not profess to know what, if any, attention has already been paid to this subject by our engineers, directors and mine managers. But the benefits it holds out, namely, the lowering of working costs and the increase of white surface occupation are of so important a nature that the fullest investigation is desirable. It may be, of course, that strong views on the subject may be held in some quarters. These views, however, can easily be elicited; their value appraised and measured against the potential benefits to be derived from the adoption of Mr. Elkan's proposals.

PRESENT UNDERGROUND CONDITIONS AND TENDENCIES.

High Pressure Working Imperative—Preparations for Ultra-Deep Level Exploitation Well-nigh Completed—The Transition Period Practically Over—A Cheerful Outlook.

A comparison between mining conditions on the Witwatersrand to-day and conditions, say, half-a-dozen years ago reveals great alterations, many advances, and generally improved labour efficiency. Since 1907—the year of the memorable strike amongst rock drill men—the Rand has witnessed many changes. The amalgamation of properties, more centralised control, augmentation of reduction plants, with a consequent call on shafts and stopes for greater tonnages and endeavours to better the lot of the underground workers particularly in regard to ventilation and the abolition of phthisis—all these are keynotes in the march that has been sounded right along the Reef from Randfontein to Geduld. To-day men work at far higher pitch than they did a few years ago. Nowadays one sees very little of men reclining on dynamite boxes and reading their favourite periodicals as so many did a few years ago. The Rand miner of to-day has to work, and work hard, or make way for those who are prepared to do so.

Comparatively High Rates of Pay.

Although the days when developers earned without difficulty incomes of four figures per annum are over, there are still men, and large numbers of them, who draw cheques that would shame many occupying far more highly responsible positions in other callings of life, and it must on the whole be admitted that the Rand miner is a very highly-paid workman, perhaps the most highly-paid workman in the world. No one grudges a good man good wages. An experienced and capable man who earns £60 per month is far preferable from the manager's point of view to four bad or indifferent workers who can only make £15. It is only right that a good worker should earn good wages, and, too, it is only right that good work should be expected of him. Apart from the high wages earned by underground workers on the Rand, the conditions under which they live above ground are infinitely preferable to those obtaining in other mining fields. Where, for instance, can one find such comfortable quarters as are provided for workers along the Main Reef, or where are recreation halls, libraries, etc., provided for miners by employers on the generous scale to be observed on the Witwatersrand?

Still Better Miners Wanted.

Taken on the whole then the lot of the Rand employee is an exceptionally congenial one. It scarcely can be alleged, however, that the Rand has the best miners. There are many first-class men employed, but on the other hand there is a vast army of men who are more to be congratulated on their adaptability to below surface conditions than on any inherent knowledge of mining. In most other large mining districts the miners generally are men who have been trained from youth in their trade. Here on the Rand an astonishingly high percentage of underground workers have only taken to mining of recent years. Half a decade ago they might have been farmers, or shop assistants, or transport riders. The high rates of pay offered attracted them; in due course they gained their blasting certificates and became fully-fledged miners. It would be an injustice to these men to make the statement that they are on the whole inefficient workers. Many of them have developed into first-class men, but at the same time a knowledge of the real functions of mining and of the best means to combat the dangers attending mining work is not ingrained in them. In other words, they almost may be said to lack the hereditary instinct which undoubtedly is strongly developed amongst the workers in longer established fields than the Rand. The lack of this inborn knowledge of mining work, acting in conjunction with the general low standard of intelligence amongst the unskilled or coloured labourers, unquestionably is largely responsible for the high accident rate of the Rand. The Main Reef series cannot, of course, be blamed for its comparative youth when compared with other mining fields. Time will remedy the defect of lengthy experience amongst large numbers of employees, and it is an eminently satisfactory sign of the times that there is growing up to-day a huge army of youths who commenced their underground training at an early age and who accordingly will tend to raise the standard of efficiency.

High Pressure Working.

It must be admitted, too, that working at very high pressure conduces towards a comparatively high accident rate. The extension of milling equipments and the raising of stamp duty has brought about far more hustle and bustle underground than ever existed formerly. There are now many shafts on the Rand which are called upon to supply a third of a million tons or more of rock per annum. Such tonnages are certainly not beyond the capacities of the shafts in question, but the delivery of such large quantities of banket has taxed the underground resources and the abilities of employees at numbers of propositions very considerably. High-speed electric winding and the handling of large tonnages of ore on main hauling and collecting levels have meant far more rush and hurry than was the custom when there was no call on underground workings for the delivery of anything like the tonnage of ore required to-day at most of the large mines. Mills have to be fed and the underground officials are expected to get the best work they can out of the labour at their disposal, and considered from a broad point of view the acceleration of underground work has been imperative.

Why There Have Been Disappointments.

And yet, it may be argued, the anticipated reductions in working expenses and the anticipated automatic transfer of ore from the unpayable to the payable side of a mine's ore reserve ledger have not materialised. Official figures show that the tendency has been for working expenses to go up of recent years rather than to decline. It must be remembered, however, that new schemes have been brought into vogue—the general use of electric power and the driving of main haulage and collecting levels—and there scarcely yet has been time for the mines to tide over the transition stage brought about by the carrying into effect of these several methods. An enquiry into the positions at a number of the more important mines along the Main Reef elicits the fact that during this year the Rand will for the first time (in so far as the majority of these mines are concerned) reap a real and representative measure of benefit from such innovations as are referred to above. As the workings become deeper further main haulage levels will have to be driven, but speaking generally from one end of the Rand to the other preparations for the exploitation of the deeper levels have only just been completed and the field has hardly yet had time to profit from rapid underground haulage, the concentration of work on and around main haulage levels and main shafts, the electrification of equipment and the installation of electrically operated underground hoists designed for hauling ore from the deepest existing levels and designed, furthermore, for hoisting from levels that have yet to be driven. We shall be surprised if the current year does not witness a general improvement in underground working conditions—not only in regard to hygiene and labour efficiency but also in regard to the machinery for coping with the future needs of large mills at depths of 4,000 feet and over. No small proportion of the disappointments of the last year or two in regard to working costs and dividends may be traced to the far-seeing technical statesmanship that has not hesitated to make adequate provision for the future, necessarily at some expense to the present.

IMPORTANT TECHNICAL CHANGES PENDING.

Mr. Way in all Probability Resigning from the Anglo-French—Other Changes—Mr. H. H. Webb's Visit.

Once again the air is full of rumours of the pending resignation of certain of the Rand's highest technical officials.

Mr. Way's Resignation.

It is difficult to sift mere idle report from truth, but we are in a position to state that some consulting engineers attached to large and important mining houses will, in all probability, retire during the next few months. More than this we cannot at the moment say, save that Mr. E. J. Way, who for some years has been technical adviser of the Anglo-French Exploration Company and its subsidiary concerns in the Transvaal—New Kleinfontein, Apex, Benoni, Rand Klip, Rooiberg Minerals Development Company, etc.—is likely to retire from his position in the controlling house at an early date. We understand that Mr. Way will retain his position as consulting engineer of the Rooiberg Company, and may yet be induced to act in an advisory capacity to certain of the mines detailed above, but the statement that Mr. Way will retire from his position of consulting engineer to the Anglo-French Exploration Company in about six months' time is, we understand, substantially correct.

The Rooiberg Management.

Rumour has been busy during the last few days with regard to changes in the management of one or two other mines under the control of this group, but we learn that these reports are quite incorrect. No permanent changes of importance are either being made or are contemplated. At Rooiberg a purely temporary alteration is being made. Mr. E. R. Schoch, who has been manager of the property since the Anglo-French Company assumed control, is leaving on a six months' holiday, and during his absence on leave Mr. J. T. Milligan, who was manager of the Rand Klip until it was decided to close down that property, will be manager. Conditions at Rooiberg, particularly as regards climate, are more trying than those obtaining on the Rand, and we understand that Mr. Schoch's application for a holiday was in the circumstances willingly granted by the board of directors.

Mr. H. H. Webb's Visit.

In the midst of all these changes and rumours of changes, the giving way of the old blood and the making of way for the new, it is a pleasure to see in our midst an old friend, who has for so long been honourably associated with the Rand in the person of Mr. H. H. Webb. Although it is some years since Mr. Webb resided on the Witwatersrand, his valuable services have been retained in an advisory capacity by the Consolidated Gold Fields of South Africa, and he is visiting Johannesburg after an absence of about three years as consulting engineer of the Gold Fields group. We understand that Mr. Webb will spend about two months of his stay in South Africa on the Rand and the remaining month in Rhodesia, where his firm have during the last year or two largely increased their interests. No doubt Mr. Webb will observe many changes since his last visit to the Rand. There have been numerous alterations and not a few improvements. No one with any knowledge of the Rand would, however, for a moment assert that there are not delicate points of policy and practice still awaiting expert treatment, and although the majority of the great problems of the mines have either been solved or are well on the road to solution, Mr. Webb will certainly find plenty of scope for the making of investigation and the giving of advice during his brief sojourn in the sub-continent.

MINING MEN AND MATTERS.

The manager of the Nigel, Mr. R. Curnow, has returned from a visit to Rhodesia.

* * * *

Mr. C. Hely Hutchinson, of the Consolidated Gold Fields, has returned to the Rand.

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Mr. Colin Ferguson, managing director of the Randfontein Estates, left Capetown for England by the Walmer Castle this week.

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Mr. S. Marks, Senator, is still at the Dudley Nursing Home, but his friends will be pleased to hear that he has recovered sufficiently to have taken several motor drives this week.

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The next annual congress of the South African Association for the Advancement of Science will be held at Lourenco Marques from the 7th to the 12th of July, and it is understood that the Governor-General of Mozambique will take an active interest in the congress. Reception and Scientific Committees have been formed, and the secretaries for these are Mr. J. F. Ferreira, and Dr. D. Pepulim, P.O. Box 245 and 704, Lourenco Marques.

* * * *

The management of the Consolidated Rand Brick, Pottery and Lime Company, Limited, has extended a cordial invitation to the membership of the Chemical, Metallurgical and Mining Society to visit and inspect the company's works at Oliphantsfontein (Pretoria line). At these works may be seen the manufacture of all kinds of fireclay goods, including crucibles, muffles, slabs, liners, etc., bricks—ordinary and glazed—sewerage and drain pipes and fittings, wall and floor tiles in all colours and patterns, as well as domestic crockery of every description. The adjoining lime works can also be visited. The Council has accepted the invitation, and has made arrangement for the visit to take place on Wednesday, the 12th March, 1913 (the works not being in operation on Saturday afternoons).

New Rand, Ltd.

Mr. A. R. Sawyer, the Consulting Engineer of the New Rand, Ltd., reports, from the drill site, that No. 17 borehole had attained a depth of 2,417 feet on the 1st instant in excellent quartzite as before, with grains and pebbles up to half an inch, scattered and in thin rows.

South African Gold Trust.

With a depreciation for the year of £212,160 to face, the directors of the South African Gold Trust felt that they could not pay the ordinary shareholders so large a dividend as they received a year ago, though even this was a decrease upon its predecessor. They are paying them 2s. per share for the whole year, as compared with 3s. 6d. for its predecessor. This reduction provided for some of the depreciation, and as for the rest, £125,000 has been drawn from reserve fund, and £87,160 charged against the profits of the year. The net profits were £55,598 as against £107,976 in the preceding year. The balance carried forward is £63,444 as against £88,804 last year. The figures are all adverse to the shareholders when compared with those of a year ago.

GEOLOGY OF THE TIN FIELDS.

Interesting Brochure by the Geological Survey—Principal Features of the Waterberg System.

Of the numerous important brochures issued by the Geological Survey of the Transvaal, none is likely to attract more attention than that which we now have to acknowledge the receipt of, namely, " The Geology of the Country Round Warmbaths and Nylstroom, including the Rooiberg Tin Fields," by the Director, H. Kynaston, B.A., F.G.S., and E. T. Mellor, D.Sc., F.G.S., with notes by W. A. Humphrey, Ph.D., F.G.S. This constitutes an explanation of sheet 10 (Nylstroom) and some study of the carefully reasoned and clearly stated geological arguments and descriptions contained in the brochure is to be commended to all who are interested in this—the most important base metal area of the Union. The sheet accompanying the publication now before us embraces an area of over two thousand square miles, situated mostly within the Waterberg district, a narrow strip in the western portion of the sheet coming within the Rustenburg district. The geological structure of this area has given rise to a great variety of physical feature. Not only are there two distinct and comparatively simple types of scenery, exemplified by the bushveld on the one hand and the margin of the Waterberg plateau on the other hand, but more varied and complex types appear in addition as the result of variations in the structure due to movements which have affected certain portions of the area. The mapping of the area was carried out mainly during the field-season of 1909 by the Director and Dr. E. T. Mellor, a considerable area, however, in the west and south-west portion of the sheet being mapped by Dr. W. A. Humphrey during 1906 and 1908. The area east of the railway in the south-east corner of the sheet was mapped by Dr. Mellor in 1904, and during the same season a small area west of the railway, between Warmbaths and Nylstroom, was mapped by the Director, who also completed the area extending westwards from Warmbaths to the Riet Spruit during 1905. In 1908 Dr. Mellor made several traverses of the Hoekbergen Range, and mapped in detail the complicated area about Gatkop, on the boundary of the Rustenburg District. On the present sheet the geology of the Gatkop Range is taken from Dr. Mellor's work. The mapping of the extreme north-west corner of the sheet to the north and north-west of Gatkop was completed by the Director in 1911, together with a revision of certain portions of the Rooiberg area. Descriptions of different portions of the area have appeared from time to time in the annual reports of the Geological Survey as the mapping has progressed, and the country lying west of Warmbaths and Nylstroom was described in the special memoir on " The Geology of the Waterberg Tinfields," published in 1909. The present description therefore treats of the geological features represented upon the map in a somewhat more generalized manner. The account of the tinfields has been brought as far as possible up to date from information obtained during comparatively recent visits. The area described is of great interest from both geologic and economic aspects. Geologically it illustrates a portion of the northern rim of the Bushveld basin, where this comes into contact with the southern edge of the Waterberg basin. The normal succession, however, of the different divisions of the Transvaal System, which usually constitutes the margin of the Bushveld basin elsewhere, is here absent and is only represented by a narrow belt of dolomite, banded ironstones, and quartzite, running west and north-west from Warmbaths. In fact, a line of severe faulting and overthrusting can be followed from the neighbourhood of Warmbaths to the Gatkop Range and beyond, along which the Transvaal System has been thrust northwards against and sometimes even over the lower portions of the Waterberg System. This is well illustrated in the neighbourhood of Gatkop. The flat or gently undulating type of country so well seen between Warmbaths and the Rooiberg, which prevails with such monotonous uniformity over a much more extensive area to the south, reaching almost as far as the Magaliesberg Range, here suddenly gives place to a broken and almost mountainous tract, commencing with the felsite and ironstone ridges west of Warmbaths, and extending northwards to the edge of the main plateau of the Waterberg. The broken character, however, of the country west of Warmbaths, which forms sharp ridges on Zwartkloof, 1,100 feet above Warmbaths Station, terminates at Cyferfontein No. 2,124, the main belt of hills forming the Lower Waterberg felsites trending northwards to Rhenosterpoort No. 2145 and Rietpoort No. 1768, and thence westward to form the southern slopes of the Hoekbergen. This range terminates on Donkerpoort No. 945 against the conspicuous eastern end of Gatkop, and from this neighbourhood the striking parallel ranges, which continue westwards to the Crocodile River, consist of the banded ironstones and underlying dolomite of the Transvaal System. To the north of Gatkop are seen in bold outline the successive escarpments of sandstone and conglomerate which flank the main escarpment of the great Waterberg Plateau. To the south lies the Rooiberg District. This constitutes a roughly triangular area of sandstones bounded on the north by the felsite range of the Elandsberg, on the west by the rough granite hills of the Boshofsberg, rising to 5,370 feet above sea-level, and on the east by the felsites of the Rooiberg hills. Both physically and geologically the Rooiberg constitutes a somewhat special area in itself, being almost entirely cut off from the other areas of sedimentary rocks, and forming with its enclosing hills the only tract of hilly country between Warmbaths and the Crocodile River valley. After a lengthy description of the area and its physical features and a discussion of the drainage and water supply the brochure proceeds to discuss the geological formations and their general distribution and structure. The exigencies of space preclude us from dealing at length with the geological analyses and descriptions of the Director and Drs. Mellor and Humphrey. We may on this account be excused if we pass on to that portion of the publication which deals with the Waterberg System. The Director's views on the economic resources of the region were dealt with in our issue of February 8, and we this week reproduce a first instalment of the Director's interesting remarks on the Waterberg System, a highly important portion of the work of the Survey.

The Waterberg System occupies most of the eastern portion of the sheet, and forms a broad belt along the northern margin. It also occupies the area known as the Rooiberg tinfields and the surrounding hills in the south-western portion of the map.

The system may be divided into the following sub-divisions :—

Upper or *Sandstone Series*, consisting mainly of sandstones and quartzites, with conglomerates and shales.

Lower { *Volcanic Series*, mainly felsitic lavas with subordinate shales.
Rooiberg Series, consisting of quartzites and shales.

The reasons for including the Rooiberg sedimentary series in the lower portion of the Waterberg System have already been given at length in the Annual Report of the Geological Survey for 1908, p. 117, and also in the memoir on the Geology of the Waterberg Tinfields, pp. 39 and 40, and need not be discussed again here.

LOWER WATERBERG.

(*a*) *The Rooiberg Series.*—These comprise the series of sedimentary rocks forming the bulk of the Elandsberg, and stretching almost to the summit of the Boshofberg. They occupy the valley between these two ranges of hills and stretch eastward beyond the Rooiberg.

The series consists in the main of felspathic quartzites, arkose, and shales, with which are associated some felsites and diabases, and is overlain by a thick sheet of felsite, which forms the Rooiberg and the crest of the Elandsberg, and covers a considerable area to the north of that range. The extension of the Rooiberg beds to the south-west abuts against rocks of the Transvaal System some eight miles to the north of the junction of the Aapies River with the Crocodile. The junction is, however, a faulted one, the Rooiberg quartzites being cut off against the Banded Ironstones and Dolomite of the Transvaal System. The base of this series rests upon the granite of the Boshof Mountains, which bears an intrusive relationship to it. The beds along the contact are quartzites, showing considerable alteration, being rich in felspar, and especially in tourmaline, which often occupies the bulk of the rock, and consists of blue, brown, and colourless varieties.

These lower quartzites are of considerable thickness, at least 500 feet. They consist of various distinct types, as follows, in ascending order :

1. Whitish felspathic quartzite with tourmaline.
2. Hard grey white quartzite.
3. Pink and white fine-grained quartzite.
4. Coarse quartzite graduating to conglomerate.
5. Whitish-pink quartzite with brown specks.
6. Quartzite, resembling fine-grained granite or aplite.
7. Hard white quartzite.
8. Pinkish sandstone, and quartzite resembling No. 6.

Of these variations one or two are worthy of special mention. No. 1 along the actual granite contact shows clearly the intrusive nature of the granite. The tourmaline here is disseminated through the rock in patches and grains, being clearly a result of contact metamorphism. No. 5 is a very felspathic quartzitic sandstone, the brown patches being composed of limonite. No. 6 in the hand specimen has much the appearance of a holocrystalline granitic rock of fine grain. Under the microscope, however, while seen to consist in almost equal parts of quartz and felspar, the rock is undoubtedly of sedimentary origin. Biotite occurs in places, but only sparsely distributed. No. 8 is the uppermost bed of this lower portion of the series, and its outcrops show much alteration. It is a pinkish sandstone, also appearing almost granitic in parts, and along this horizon chiefly occur those massive outcrops of tourmaline with which cassiterite is associated so plentifully, and in which the shafts of the Rooiberg tin mine have been sunk. In the upper beds of these quartzites is a thin sheet of felsite of some twelve feet in thickness. In the hand specimen it is deep blue in colour, with small pink felspar phenocrysts throughout. Microscopic examination shows phenocrysts having the shape of quartz, but consisting of beautiful micrographic intergrowths of quartz and felspar, together with large quartz crystals. Very pronounced flow structure marks this rock. Overlying these basal quartzites is a band of shales which are pesistent across the terrain. Outcrops can be seen in the drift between the tin mines and Upton's store, also on the western extension of the horizon in the bed of the most westerly of the spruits joining the Vaalwater on the south. They are very cicaceous and well bedded in the more easterly outcrops ; on the west, however, they are hard and compact, and show little signs of bedding. A well-marked and fairly persistent sheet of diabase overlies these shales. The diabase is followed by white quartzites, which on the farm Olivienpoort No. 758 are apparently overlain by a coarse-grained granite. This granite closes the succession of sedimentary rocks in this westerly section, and stretches in an unbroken line to the east, where it abuts upon the felsite which overlies the sidmentaries. On the Elandsberg this quartzite is followed by a series of quartzites and shales, which show good outcrops on the face of the hills on the farm Olivienbosch No. 939. In all, overlying the main quartzites on this farm, are three horizons of alternating shales and quartzites, presenting fairly uniform characteristics, of which the lowest has been described above. The upper beds vary somewhat along different sections, igneous intrusions and flows being more developed in westerly sections of the Elandsberg than to the east. The succession of these upper beds forming the southerly slopes of the range is as follows. The section is taken on the farm Olivienbosch No. 939 along the western boundary of the farm.

Pink and white felspathic quartzite of varying grain	50 feet.
Black to red felspathic quartzite	
Diabase amygdaloidal	20 feet.
Red mottled sandstone	100 feet.
Pure white quartzite	
Shale	100 feet.
Whitish grey quartzite	20 feet.
Felsite.	

Followed to the west this succession becomes less marked ; the ridges formed by the quartzites die away and outcrops are wanting. A horizon composed of a peculiar arkose makes it appearance. It varies from a fine-grained to exceedingly coarse aggregate of quartz and red felspar with iron ores. The rock occasionally bears a very close resemblance to granite. These upper horizons cannot be traced to the west, as the detritus from the felsite, whose outcrops begin to descend the southern face of the range on the farm Onverwacht No. 294, tend more and more to conceal the underlying sedimentary horizons. In the south-westerly extension of the Rooiberg beds towards the Crocodile River the rocks consist mainly of quartzites and sandstones of rather diverse character. The lower beds show a thin series of white quartzites of even grain, which form kopjes on the farm Driefontein No. 690. These are occasionally followed by dark green fine grained quartzites, spotted with olive green. These quartzites in their higher horizons become micaceous, and gradulate into a series of fine-grained red sandstones, with occasional white bands. These sandstones form a long even " bult," traversing the centre of the series. They are again overlain by hard quartzites, which form prominent ranges on the northern portion of the farm Koperfontein No. 528, and the southern portions of the farms Rooikranz No. 160 and Knoppieskraal No. 943. The character of these quartzites is different from those of the lower horizons. They are white to pale green in colour, of even texture, and great hardness, and are followed by a fine-grained blue rock, which occasionally appears almost like massive quartz. It contains, however, a considerable admixture of felspar, which weathers out, leaving a rough pitted surface.

A broad band of dark grey and bluish shales is well developed on Leeuwpoort No. 938, and dips nearly due east towards the felsites of the Rooiberg. It is probably at the same horizon as the shales shown upon the map on Vellefontein No. 937, but it cannot be tracted northward beyond the western portion of Rietfontein. To the south these shales extend into Driefontein, where they gradually taper out against the felsite. The quartzites immediately below this horizon of shales carry tin on both Vellefontein and Leeuwpoort. In the north-eastern portion of the Rooiberg area, between the northern end of the Rooiberg hills and the eastern portion of the Elandsberg, the structure is that of a gentle anticline, with an axis trending roughly north-east and south-west, the beds dipping regularly and consistently beneath the felsites of the two ranges, while between them, on Blokdrift, they are disposed almost horizontally. Further on to the north-east between Blokdrift and Kareefontein, westerly and north-westerly dips prevail, the lower beds resting upon the granite on the east and forming a low ridge extending from the central portion of Hartebeestpoort No. 253, across the eastern portion of Kwarriehoek into Karreefontein. Along the northern portion of Kwarriehoek the dips become mostly northerly, and are here directed towards the granite of the Zand River Valley. The angle of dip as a rule is higher than further south-west, and varies from 15 to 20 degrees, while in the south-west portion of Hartebeestpoort it is often as high as 40 degrees, and is here directed south-west towards the felsites of the Rooiberg. The sandstone series shows on the whole identical characters to those already described from the more central portion of the area in the neighbourhood of the tin mines. The lower beds, however, along the line of the granite contact on Hartebeestpoort and Kwarriehoek are usually fine-grained and compact, white, grey, pinkish, and often banded, and have been intensely indurated by the intrusion of the granite. In the general appearance and mode of weathering these lower beds strongly recall the quartzites of the Pretoria Series. The actual contact with the granite is well exposed in the south-west portion of Hartebeestpoort, a short distance below the drift on the new Rooiberg road, where the spruit enters a small rocky gorge. The quartzites are considerably disturbed, and close to the contact show one or two small but well-marked pegmatite veins running parallel to the bedding. The marginal portion of the granite is of the fine-grained porphyritic type, and also carries pegmatites. Tourmalinization of the sandstones, identical in character to that so constantly associated with the tin-bearing portion of the district further west, is a very common feature, and occurs along certain zones or sometimes in irregular patches. It does not appear, however, to be specially connected with the actual contact with the granite, as along the eastern margin of the sandstone area it is usually absent, but rather to be connected with lines of fissuring, which probably have a deep-seated origin. Shales are well developed in the upper portion of the series. A broad band extends across the southern portion of Blokdrift, and can be followed in the eastern portion of Blaauwbank, where it has been prospected for tin. From here the outcrop becomes narrower, owing to an increase in the angle of dip, and follows the base of a series of small quartzite escarpments round the northern end of the Rooiberg felsites, and is well exposed in the south-western corner of Hartebeestpoort, where the beds gradually bend round to the south, until they are cut off by the granite on the northern slopes of Quaggafontein. Another band of shales follows the southern slopes of the Flandsberg. Similar beds are again well exposed to the east of the Elandsberg on Kwarriehoek, where they form a well-marked feature on the southern slopes of the line of hills which terminates in Groenkop, and probably here attain a thickness of some 50 feet.

Union Diamond Output. The official mining statistics for January include details of the diamond output for 1912. The Transvaal provided 2,131,406 carats, value £2,386,979, whereof 2,049,767 carats were from the Pretoria district, and the remainder from the alluvial diggings in the Klerksdorp district. The Cape returned 2,325,548 carats, value £6,190,966, Kimberley being responsible for 2,232,253 carats, value £5,633,602, the other districts contributing being Barkly West, Herbert, Kuruman, and Vryburg. The Free State produced 614,927 carats, value £1,483,544, Fauresmith district being the largest contributor with 419,228 carats, value £1,266,518. Boshof, Kroonstad, and Winburg provided the balance. The total output for the Union was 5,071,822 carats, value £10,061,489, compared with 4,891,989 carats for 1911.

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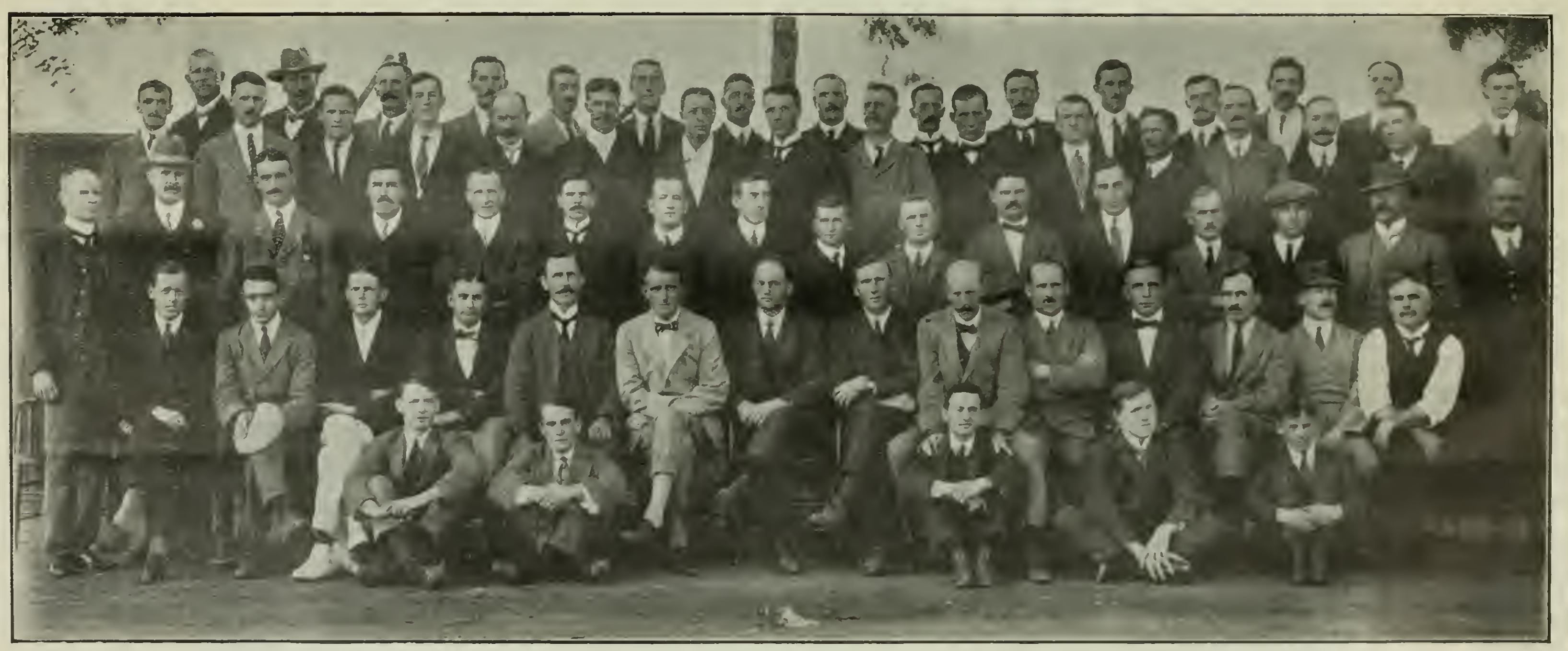
The E.R.P.M. in February. Although February was a short month, the East Rand Proprietary Mines earned a profit of £89,514, which is pretty well up to the average monthly earning of last year. There were as usual 820 stamps at work and 150,100 tons were milled. The gold recovered amounted to 56,907 fine ozs., including 1,233 ozs. recovered from accumulated slime. The profit, too, included £3,524 from slime accumulation.

THE MANAGER AND STAFF OF THE VILLAGE DEEP.



Top Row.—T. McMeekan, foreman smith; H. Berry, foreman carpenter; D. Mitchell, foreman timberman; J. T. Triggs, cyanide foreman; J. Hathorn, shiftboss; J. Micklewright, shiftboss; H. V. Morris, white timekeeper; J. Williamson, shiftboss; C. E. Deakin, underground native supervisor; V. C. P. Borcherds, assistant native timekeeper; R. Rock Currie, clerk; J. Beck, shiftboss; A. G. Quirie, sampler; V. L. Hall, assistant white timekeeper; D. B. A. Schuitema, post graduate student.

Second Row.—A. White, shiftboss; W. S. New, assistant surveyor; D. Allport, assay learner; C. G. Mortimer, assay learner; J. A. Noble, foreman mason; E. Lewin, foreman timberman; K. V. Cunliffe, sampler; J. Curran, shiftboss; D. G. Moore, clerk; D. M. Munro, mill foreman; J. Dixon, shiftboss; A. O. G. Wocke, draughtsman; J. Mylechrane, shiftboss; C. E. Wollaston, shop foreman; R. Wilson, foreman fitter.

Third Row.—T. F. Vincent, assistant secretary; J. Hunt, shiftboss; H. Formby, sorting and crushing foreman; W. H. Smith, hospital superintendent; H. Monckton, assayer; E. Smith, mill foreman; R. D. Carlyle, clerk; A. B. Smith, draughtsman; C. J. Arundel, surveyor; H. W. Venables, native timekeeper; E. Mack, assistant compound manager; P. A. Crewell, assistant surveyor; R. V. Ashe, assistant compound manager; E. F. Williams, assistant assayer; G. H. Morine, surface foroman; J. Gilligan, chief electrician.

Fourth Row.—J. A. McMillan, assistant storeman; R. W. McNeillie, mine captain; J. H. P. Bilbrough, mine captain; J. E. Jones, mine captain; D. Hunter, mine captain; E. F. V. Wells, underground manager; J. Whitehouse, manager; B. Gray, engineer; P. H. Robbs, secretary; J. Brown, mill manager; C. M. Egan, cyanide manager; C. J. Buchanan, compound manager; H. P. Townsend, manager's assistant; T. H. Lake, storeman.

Bottom Row.—F. King, sampler; W. A. Moses, sampler; J. Cohen, assayer's assistant; H. V. M. Barrett, sampler; J. K. Fowle, sampler.

AN IMPORTANT ENGINEERING ENTERPRISE.

Growth of Local Manufacture of Rock Drill Parts.

To Messrs. Delfos Bros., Ltd., of Pretoria, belongs the credit for having demonstrated the feasibility of making rock drills and rock drill spares locally of a quality able to compete with the imported article. Hidden away in the heart of Pretoria there is growing up to-day an industry of already respectable proportions which finds on the Rand a ready market for its various and well-finished products. The engineering works of Messrs. Delfos Bros. were, some eighteen months ago, converted into a limited liability company, and though general engineering work is not neglected, the firm has come to specialize in the making of rock drills and rock drill parts. So excellent is the workmanship shown, and the prices so satisfactory that one has no hesitation in predicting for the products of the company a big future, when they come to be better known. A representative of this paper was recently shown over the works by the courteous managing director, Mr. Delfos, and was struck by the enterprise displayed in their equipment, with all the latest tools and machinery. Some of the best types of English, American and German machine tools have been installed, and the capital sunk in the venture represents a good round sum. White labour is employed almost exclusively throughout; and it is noteworthy that the products of the firm have succeeded despite the absence of a protective duty and with no artificial aid in the shape of State bounty. The accompanying illustration gives an idea of the equipment of one section of the works, and engineering visitors to Pretoria should not neglect to pay them a visit.

MECHANICAL AND METALLURGICAL ADVANCE ON THE RAND.

A Review of Progress Last Year—Rock Drills and Detachable Bits—Surface Innovations.

"1912 has not seen any revolutionary introductions of labour-saving appliances or new inventions of far-reaching effect, tending to reduce working costs, but the application of previously known and experimented with appliances has been extended considerably," said Mr. Elkan at the annual meeting of the Chamber of Mines, last week. "As far as the underground work is concerned, I would like to mention the truly remarkable increase that has taken place in the use of rock drills in the last few years. The earliest reliable figures at my disposal show that the gold mines used, in 1908, 2,425 such drills, and ever since then their number has been steadily increased, until it reached last year 5,530, or more than double the number that were in use in 1908. While formerly only large machines were used, the mines have now a number of small machines of various types at their disposal, but the last word with regard to drills has by no means been said yet. I understand that no drill is absolutely ideal and applicable to the different reef conditions obtaining in a mine, thus calling for various types having to be used in each mine. The endeavours of the manufacturers to supply us with what is really required deserve a word of praise, and it must be hoped that eventually they will succeed in turning out a drill meeting all our requirements.

Detachable Bits.

Much attention is being paid to detachable bits, and much is claimed for certain inventions made locally during last year. They are now being tried extensively, and are, I am informed, showing, so far, good results, which augurs well for the future, for, if they should really prove efficient under severe working conditions, it would reduce the immense quantities of steel which have daily to be handled through the shafts and transported through the workings, to a negligible quantity, and mean an appreciable saving in cost. In this connection may also be mentioned the introduction of a successful machine for sharpening steel for rock drills, which does away with the laborious hand method, and gives a more accurate gauge of steel, a point which is of importance in securing the highest efficiency from these drilling machines. The drill-sharpening machines previously at our disposal did not offer the same advantage. Considerable changes are taking place in the transport of material underground. The concentration of ore on main levels, whence it is transported by means of power applied in various ways to the shaft, is meeting with a considerable amount of success, tending particularly to the saving of manual labour. While, then, satisfactory progress is being made in the transport of ore, once it has been got out of the stopes, the advancement in methods of handling ore in the stopes has not been quite so noticeable. Although a number of different systems to take the place of the crude ways employed in the early days have been tried, there is still a large field for further improvements which would decrease the large numbers of unskilled labourers required for this work.

On the Surface.

On the surface, the filter process for the treatment of slimes is proving the success the inventors claimed for it, and new installations are being erected on a number of mines. The zinc dust precipitation process has continued to be found successful in several cases, but it has not yet been proven that it is equally applicable in all and every case. Some interesting trials were made with the Nissen stamp, the inventor claiming for it great savings. The trials have in some respects proved successful, but it has not been shown that the saving to be effected by the use of these stamps would compensate for the cost of substituting these in place of existing crushing plants; I understand, however, that several Rhodesian mines, which are on the point of erecting reduction works, are going to use these stamps."

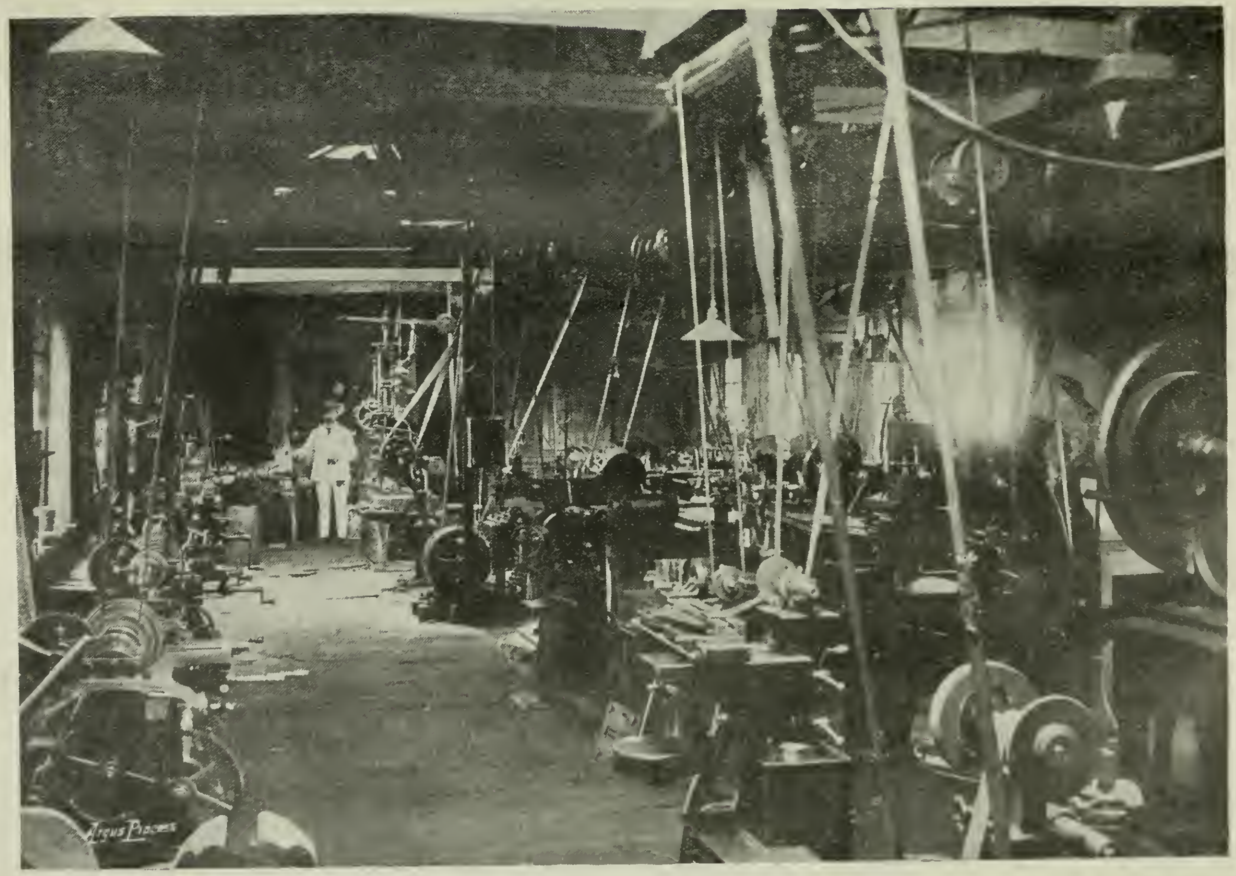
Geological Survey Department.

The following telegram was despatched from Pretoria this week:—From Civic Association to Sir Percy Fitzpatrick, Capetown. Civic Association, Pretoria, sends greetings. Please ask question House why Geological Survey Department being removed to Capetown. Citizens most concerned. Matter most urgent. A wire has also been sent to Sir Thomas Cullinan on the same lines and Mr. Malan, the Minister for Mines, has also been communicated with.

Blaauwbosch Diamonds.

The washing returns for February, 1913, of Blaauwbosch Diamonds are as follows:—7,652 loads washed, 1,614 carats recovered, or 21·09 carats per 100 loads. Washing was considerably hampered during February by erection of additional new plant which will necessitate total stoppage of washing operations for about one month. Fall in yield for the month of February due to ground washed being largely mixed with shale from reef.

A PROMISING LOCAL ENGINEERING INDUSTRY.



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INTERIOR VIEW OF WORKS OF MESSRS. DELFOS, LTD., AT PRETORIA.

DEEP SHAFT SINKING.

Points from Le Neve Foster Memorial Lecture.

[By C. B. Brodigan.]

At the Royal School of Mines, recently, Mr. Charles B. Brodigan, A.R.S.M., delivered the Le Neve Foster Memorial Lecture, his subject being "Deep Shaft Sinking." The lecturer prefaced his remarks by a short introduction, in which consideration was given to the conditions which guide engineers in fixing the type, position, and number of shafts that should be sunk on a given area in order that the ore in that area might be efficiently and economically extracted. A definite area in which the depth, dip and contour of the reef were known, and the advantages of shafts sunk upon a dip line compared with those sunk upon a strike line, were considered, the former being advocated as best for the particular area under consideration. Then details as to type and cost of the temporary equipment necessary to sink a seven-compartment shaft to a depth of between 3,000 and 4,000 feet were given. Thus, 16½in. by 33-in. geared, double-drum hoists were selected; these were supplied with steam by five externally fired multitubular boilers. The heargear was of wooden frame construction, 65ft. high, and cost, erected, about £1,100. The whole temporary plant for one shaft cost about £14,700. This sum includes all charges for buildings, kibbles, crossheads, ropes, etc., and even the charge for dismantling the plant when it was finished with. The actual sinking of the shafts was carried out by the aid of buckets or kibbles, and the author said that opinion on the Rand was actually divided on the subject of the relative advantages of that system as against shaft sinking by means of skips. Much might be said for both systems. The bucket system is certainly quicker and handier, but as the result of his experience the lecturer had come to the conclusion that the skip system was safer. The ropes used throughout the sinking were ¾-in. plough steel, ordinary lay, which gave a factor of safety of over 8, even at the bottom of the shafts. Before describing the actual method adopted in the sinking, the manner in which the collar-set was fixed and supported was described in detail. The sinking was described by taking the morning shift of eight hours, and retailing in detail the work that was done during that period. Thus the starting point was taken as the time when the sinker in charge of the previous shift had counted the shots resulting from the previous blast, and having reported the miss-fires to the oncoming sinker, who thereupon, accompanied by his helper and the timbermen, descended to the bottom set of timbers and cleared away the debris resulting from the previous blast. This having been done, the sinker descended to the shaft bottom, to which also forty or sixty "boys" constituting the shovelling shift were at once sent down. The importance of order and arrangement in the work of rapid removal of the broken rock resulting from the blast was illustrated, and also the necessity for thoroughly removing the broken rock in order that no chance of discovering unexploded gelatine might be overlooked. As soon as the task of cleaning out is completed the remainder of the shift of "boys" are sent down to drill. The complete shift in the shaft will then number about eighty boys. Owing to the ends of the shaft being slightly higher than the intervening space it was possible to start backward boys drilling at the end before the cleaning out was completed. It took four holes to break to the width of the shaft, and from forty to sixty holes in all—they are drilling to an average depts of 3ft. when the ground is fair and good—to break the bottom. It is impossible to average the amount of gelatine used per round; so much depends on the state in which the shaft is left from the last blast, on the depth of the holes to be blasted, and on the ability and temperament of the sinker in charge of the shift. The method of lighting the blast by means of a "Cheesa" steel was then described, mention being made of the fact that two lengths of fuse, each 12½ feet long, with No. 6 detonators attached, were used to each hole when there was water in the shaft, giving about six minutes for the sinker to get all his charges lit and to get up to surface.

The method of timbering the shafts was then described, and the importance of great care and attention being given to the selection of good, sound timber for blocking and wedges, in addition to that for the main framing. It was remarked that it was almost impossible to get in South Africa pitch pine in long lengths suitable for shaft framing, and that for the particular shafts described Tasmanian stringy-bark was selected. It has the disadvantage of warping badly on drying, but is, in the author's opinion, preferable to the pitch pine at present in the market. The method of lowering, filling and blocking the timber sets was described with sketches. As regards blocking, great insistence was laid on the necessity for cutting the blocks to suit the rock against which they are to be fixed, and never allowing the timbermen to place wedges between the rock and the block, but between the block and the wall plate. The timbering of the shaft is carried on while the boys are drilling in the bottom, and such is the skill of the men engaged in the work it is very rarely that any accident happens from this cause. The timbermen, of whom three are employed, have to keep pace with the sinkers, and in no case must the last blocked set of timber be more than 50 feet above the bottom of the shaft. The timber sets are, when the shaft is in good, solid ground, spaced at 7 feet 6 inches intervals, so that in a good month—say when 180 feet have been sunk—these three men hang and block twenty-four sets per month, in addition to putting in guides and other necessary work in the shaft. In cases where water is met with in sinking, air-driven, reciprocating pumps are fixed on the timber, which in such cases are carried down within 15 or 20 feet from the bottom, and the water is pumped up to a ring launder constructed to the timber sets, from which it can be bailed or pumped to the surface. These ring launders are constructed successively as the sinking proceeds, the object in all cases being to enable the pump near the bottom to work under as low a lift as possible. In this manner the wear and stoppages due to grit in the water will be minimised. The use of suspended centifugal pumps for use in Rand sinking was considered inadvisable. The guides used in the Brakpan shafts were those known as "Wood's Slotted Guides." They are made of mild steel, modified rail sections. They are a great source of strength to a shaft, owing to the long length of steel tying the timber sets together. They also possess the advantage that the chance of a broken guide causing an accident is extremely remote. Upkeep and inspection are also less than with wooden guides, but, on the other hand, steel guides cost, for a shaft equipped with four hauling ways, about £2 per foot of shaft more than a similar shaft equipped with wooden guides. This is a fact that must be borne in mind when comparing the cost of sinking various shafts. In a truly vertical shaft, free from acid water, the author believes that steel guides are worth the additional money. He would, however, prefer to wait upon the results of their service in the Brakpan shafts before giving a definite opinion.

Comparative costs, giving the cost per foot for very good and fairly bad ground, were then given: July 1907, 204 ft. sunk, cost per foot £23 4s. 8d.; November 1907, 120 ft. sunk, cost per foot £31 7s. 5d. During the sinking of the Brakpan shafts a very satisfactory rate of sinking was maintained. Thus, No. 1 shaft, was sunk over 3,000 ft. in almost exactly two years; that is, an average over the whole period of 120 ft. per month. No. 2 shaft, once the water troubles were overcome, maintained an average sinking of 152 ft. per month for a period of seventeen months. During the sinking of No. 2 shaft, the previous record for vertical sinking was beaten, but the record has since been beaten handsomely by both the Modder Deep and the State Mines, which are situated in the immediate neighbourhood. To complete the tale of progress, it may be stated that the first sod was cut on May 24, 1905, and that the battery started work on the same day six years afterwards, during which period approximately £1.250.000 had been spent on the property. During the whole period the author was in charge as manager, and Mr. W. L. Honnold was consulting engineer.

Roberts Victor.

The following was the result of the working of the Roberts Victor mine for the month of February, 1913:—14,003 loads washed, 4,113½ carats recovered. Reduced quantity of ground washed owing to rains.

Sheba G.M. Co.

The following are the results of the working of the Sheba and Rosetta mines for February:—Sheba: Crushings for the month (mill ran 26 days) are 5,500 tons, yielding 2,963 ozs. Estimated profit, £4,057. Rosetta: During months of January and February the crushing was 178 ozs. from 734 tons.

Pretoria Portland Cement Co.

The annual meeting of the Portland Cement Co., Ltd., was held last week. The report, which recommended total dividends of 40 per cent. for the year ended December 31, 1912, and which showed a net profit for the twelve months of £76,530 17s. 10d., was adopted. The chairman (Mr. H. Eckstein), in his remarks, spoke optimistically of the outlook of the company. The sales had shown an appreciable increase on the previous year, which had enabled the average selling price to be further reduced. The company had investigated all possible openings for the establishment of a branch of the industry near the coast. The retiring directors were unanimously re-elected.

SMELTING OPERATIONS IN KATANGA.

Further Plant to be Installed—Copper Prices, Supplies and Stocks.

Smelting operations again are proceeding at the Lubumbashi smelter of the Union Minière in the Katanga, and although the working costs and transport charges are high, fair profits are being earned. All the ore smelted is being drawn from the Star of the Congo Mine, where development is being pushed on with, and where discoveries in shafts sunk 91 feet below water level are stated to be encouraging. So far smelting operations have been proceeding with one furnace only, and the outputs were—in 1911, 996 tons; and in 1912, 1,002 tons in the first period, and 1,038 tons in the second period. Another furnace is now due to be working. This will be of the same size and capacity as that employed to date. Other equipment, including a briquetting plant, is due to arrive at Lubumbashi in June next, and unless further serious metallurgical difficulties are met with, the current year should witness a substantial augmentation of output. Over and above these additions the erection of a new group of furnaces is under consideration. Important tests have been proceeding for some time past in connection with concentration, the aim being to effect better separation by mechanical preparation. At the Star Mine a plant for sorting and washing now is practically completed. A washing plant for coal has been erected at the Wankie Colliery in Northern Rhodesia, and this is expected to have a marked and beneficial effect on smelting operations, as the unwashed material contains a high percentage of sulphur and ash. As to the other copper mines, and notably Kambove, where close on 3,000 feet of crosscuts for adits have been driven, these will be developed as the railway is advanced. As to the tin properties, the "specialist engineer" will arrive from the Malay Peninsula with a selected staff in three months' time, and will commence work on the Kasonso deposits near Bukama. Whilst the exploitation of the cassiterite eventually may result in a substantial augmentation of the Union Minière and Tanganyika Concessions Company's revenue, it is, of course, on the copper deposits that the future of Katanga mainly depends. Copper being of such paramount importance to the company, it should be of interest to note the essential figures relative to production supplies and prices as stated in the latest copper reports of metal merchants and brokers. According to James Lewis and Sons, the market for standard copper was subject to considerable fluctuation during December, with but little change at the close. In sympathy with a rapid depreciation in the value of the shares of the leading copper-producing companies, prices declined from £76 17s. 6d. for cash on December 2nd, to £73 5s. on December 16th, and subsequently gradually recovered to £76 12s. 6d., this being the closing value of the year, against £63 at the end of 1911. Sales during December amounted to about 35,000 tons. Consumers have bought refined copper sparingly, declining to pay the abnormally high price of 17¾c. per pound, or £82 per ton, c.i.f., demanded by the leading American refiners for electrolytic, supplying their requirements from other sources, English and Japanese, while some purchases from the smaller American producers have been effected at 17¼c. per pound. Exports from the United States during December were 29,274 tons. This will include the excess of "deliveries for export" by refiners over the custom house exports for November of 5,812 tons. A further considerable increase in American refiners' stocks at the end of December may be expected. Imports into Germany for eleven months amount to 191,993 against 176,525 tons in the same period of 1911; and the exports to 9,050 against 8,429 tons. The consumption of foreign copper is 193,778 against 169,796 tons, an increase of 23,982 tons. For the ten months the increase was 30,246 tons, showing a reduction of 6,264 tons for the eleven months, as compared with the ten months' period. European stocks have increased 785 tons, but the visible supply has decreased 40 tons during December. Imports are 4,725 and deliveries 15,165 tons less than during the same period of 1911. Total arrivals in England and France for December were 18,820, and deliveries 18,352 tons fine copper. Arrivals in England from Chile were 2,172 and deliveries 1,983 tons, and from other countries 12,618 and 11,862 tons respectively. Arrivals at Liverpool and Swansea from the United States were 2,875 tons of bars and 630 tons of ingots, equal to about 3,191 tons fine; in London, 311; and in France, 2,190 tons fine. Chile charters are advised as 3,300 tons, including 1,325 tons for the United States.

Stocks of Copper (tons fine).

	Jan. 1, 1910.	Jan. 1, 1911.	Jan. 1, 1912.	Jan. 1, 1913.
Chilean in—				
Liverpool and Swansea	11,121	10,123	4,225	5,318
France	815	530	711	832
American in—				
Liverpool and Swansea	38,166	25,415	12,939	1,116
France	4,888	5,120	4,033	2,992
Sundries in—				
Liverpool and Swansea	2,629	1,151	786	1,194
London and Newcastle	24,960	10,907	6,462	3,234
Birmingham	241	607	346	325
France	596	130	507	572
English in—				
Liverpool and S. Wales	18,553	18,715	17,346	16,516
Total in England and France	101,972	72,997	47,358	32,159
Sundries in—				
Germany and Holland	2,200	16,300	13,400	2,882
Total European stocks	104,172	89,297	60,758	35,041
Afloat (as advised by mail and cable to date)—				
From Chile	3,250	3,600	1,575	2,800
From Australia	3,800	7,200	8,350	5,400
Total visible supply	111,222	100,097	70,683	43,241

Luipaardsvlei Estate.

The following is the result of operations for the month of February, 1913:—60 stamps ran 26.214 days, crushing 15.510 tons, yielding 1.619 fine ozs.; 3 tube mills ran 26.778 days, yielding 754 fine ozs.; 11,000 tons sands treated, yielded 1,380 fine ozs.; 4,510 tons slimes treated, yielded 344 fine ozs.; working profit, £2.157; sundry revenue, £900.

Rand Klip.

The undermentioned developments for the month of February, 1913, have been cabled to the London office of the company:—First level east: footage sampled, 10; value, 1·96 dwts.; width, 10·50 ins. No. 2 winze, first level east: footage sampled, 85; value, 5·31 dwts.; width, 22·71 ins. Second level east: footage sampled, 85; value, 2·38 dwts.; width, 15·71 ins. Second level west: footage sampled, 105; value, 6·19 dwts.; width, 18·48 ins. Main winze: footage sampled, 95; value, 5·08 dwts.; width, 21·47 ins.

East Rand Proprietary Mines.

A cablegram has been despatched to the London office of the East Rand Proprietary Mines stating that the following are the results of last month's operations: 820 stamps milled 150,100 tons; 56,907 ozs. fine gold recovered, including 1,233 ozs. fine gold recovered from the accumulated slime; £89,514 profit for the month, including £3,524 profit from accumulated slime. The monthly profits for 1913 are: January, £95,698; February, £89,514.

JANUARY COSTS, GRADE, AND PROFITS.

Chamber of Mines' Analysis.

The usual monthly analysis of the gold production for January issued by the Chamber of Mines is presented hereunder:—

THE WITWATERSRAND.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West United	19,472	27	1	20	7	14,834	4,635	6	5
2. Bantjes Consolidated	38,599	27	11	23	4	32,123	5,953	4	4
3. Brakpan	91,122	30	8	17	4	51,195	39,115	13	3
4. Cinderella Cons. ..	25,291	25	7	25	4	24,560	1,522	1	0
5. City Deep	79,989	37	0	25	1	53,559	24,475	11	6
6. City and Suburban ..	52,791	38	8	20	7	29,438	22,721	16	8
7. Cons. Langlaagte ..	58,338	26	1	18	0	40,136	18,201	8	2
8. Cons. Main Reef ..	34,513	31	8	20	1	21,910	12,217	11	3
9. Crown Mines	298,879	31	5	16	11	161,219	134,334	14	2
10. Durban Roodepoort	15,101	21	6	15	9	11,092	4,006	5	8
11. Durban Rood. Deep ..	38,361	29	9	24	6	31,593	6,346	4	11
12. East Rand Proprietary	263,066	30	10	19	11	164,733	95,698	11	7
13. Ferreira Deep ..	113,852	41	5	20	1	54,847	57,259	20	11
14. Geduld Proprietary ..	19,789	27	9	21	7	15,349	4,313	6	1
15. Geldenhuis Deep ..	82,644	29	9	25	2	68,990	12,722	4	8
16. Ginsberg	21,978	30	3	20	1	14,582	7,396	10	2
17. Glencairn Main Reef	18,371	16	3	14	8	15,588	2,784	2	7
18. Jumpers-cum-Treasury	14,519	40	3	38	2	11,635	2,024	6	8
19. Jupiter	39,869	19	0	17	11	37,410	4,020	1	11
20. Knight Central ..	31,616	22	8	19	0	25,988	5,231	3	10
21. Knights Deep ..	82,070	14	9	10	8	59,134	22,195	4	0
22. Lancaster West ..	21,137	39	10	33	5	16,659	4,394	8	10
23. Langlaagte Estate ..	61,983	19	10	17	3	47,485	16,004	5	10
24. Luipaardsvlei Estate	17,883	20	1	17	8	15,596	2,068	2	4
25. Main Reef West ..	28,494	29	2	22	10	22,329	5,859	6	0
26. May Consolidated ..	15,211	21	6	15	9	11,156	4,020	5	8
27. Meyer and Charlton	32,270	44	7	17	11	12,962	19,243	26	7
28. Modderfontein B ..	61,184	34	10	17	5	30,625	29,852	17	0
29. New Goch	28,150	20	1	15	11	22,268	5,915	4	3
30. New Heriot ..	20,381	33	11	20	7	11,967	8,214	14	2
31. New Kleinfontein ..	70,924	27	10	18	3	46,638	23,496	9	3
32. New Modderfontein ..	99,235	38	1	20	2	52,104	45,120	17	6
33. New Primrose ..	36,165	28	8	13	11	17,446	18,718	15	0
34. New Rietfontein ..	18,966	23	5	20	4	16,470	2,496	3	1
35. New Unified	16,838	27	5	19	8	11,789	5,048	8	5
36. Nourse Mines ..	84,564	31	7	21	6	56,995	26,657	10	1
37. Princess Estate ..	29,105	25	4	24	2	27,298	1,696	1	6
38. Randfontein Central..	273,741	24	3	16	4	184,483	86,152	7	8
39. Robinson	101,669	35	8	14	1	39,730	60,184	21	3
40. Robinson Deep ..	71,808	24	10	16	0	46,245	27,317	9	5
41. Roodepoort United ..	30,452	21	7	19	4	27,210	3,282	2	4
42. Rose Deep	98,254	28	6	16	11	58,325	38,903	11	3
43. Simmer and Jack ..	80,996	21	2	11	5	43,603	38,307	10	0
44. Simmer Deep ..	53,267	17	4	14	6	44,354	6,225	2	0
45. Spes Bona Tribute ..	6,716	21	3	—		—	—	—	
46. Van Ryn	55,875	27	10	15	10	31,765	24,144	12	0
47. Village Deep	76,935	30	6	20	0	50,523	25,562	10	1
48. Village Main Reef ..	76,748	36	8	18	6	38,065	36,557	17	9
49. Vogelstruis Estate ..	16,107	25	6	22	5	13,598	2,540	4	2
50. West Rand Central ..	3,466	42	11	38	6	3,109	356	4	5
51. West Rand Cons. ..	43,900	29	1	24	0	36,028	8,022	5	4
52. Witwatersrand ..	49,316	24	10	14	4	28,498	20,817	10	6
53. Wit Deep	54,001	28	7	18	7	35,136	18,325	9	8
54. Wolhuter	36,836	26	9	18	2	24,914	11,456	8	4
Miscellaneous producers	19,713	—		—		—	—	—	
Witwatersrand totala ..	3,232,440	27	8	18	0	2065284	1113579	9	9
				53 cos.		53 cos.	53 cos.	53 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
HEIDELBERG—									
1. Nigel	20,143	28	8	23	6	16,211	3,706	5	4
2. Sub-Nigel	8,385	34	6	30	5	7,377	2,157	8	11
BARBERTON—									
3. Barrett	650	4	11	—		—	—	—	
4. Sheba	13,877	57	3	35	4	8,559	5,319	21	11
5. Worcester	4,303	16	3	14	9	3,915	366	1	5
LYDENBURG—									
6. Glynn's Lydenburg ..	8,194	44	3	19	1	3,538	4,460	24	1
7. Transvaal G.M. Estates	42,656	52	2	20	11	16,597	24,141	30	6
Miscellaneous producers	22,468	—		—		—	—	—	
Total (outside districts)	120,676	37	10	23	3	56,197	40,149	16	7
				6 cos.		6 cos.	6 cos.	6 cos.	
Grand Totals ..	3,353,116	27	11	18	2	2121481	1153728	9	10
				59 cos.		59 cos.	59 cos.	59 cos.	

"M.O.A.": A Welcome Appearance.

We have by this mail received the 1913 issue of "M.O.A.," that highly useful publication issued by *The Statist* and compiled by Mr. R. R. Mabson, which has come to be an essential to all who study, direct or possess wealth in the many mining fields of Africa. The new edition of "Mines of Africa" ("M.O.A.") contrasts remarkably with the first volume, brought out twelve years ago. The 1900 volume contained 378 pages; the size of the present volume is over 834 pages, including an exhaustive Preface that deals with the gold production of the world and the part taken in production by Africa, which now yields about 37 per cent. of the world's gold output. The condensed statements of fact and information given in the book enable anyone who has not *ab initio* followed the fortunes of a mining company to gather quickly by reference to "M.O.A." the history of that mine, with development detail in the case of a mine that has not yet reached the producing stage, or the status of a mine that is producing, disclosed by the output and results secured, as well as by recent development indications. The arrangement is adhered to of strictly alphabetical order all through, and the classification of information is designed to economise the busy man's time. There are set out the full title of each company, with date and place of registration, detail as to offices, directors, staff, place and date of meeting, the date that the accounts are made up to, the nominal and issued capital, financial position; particulars being given as to how many, if any, of the unissued shares are under option. Such official data are added to by facts as to the location of and nature of the company's properties, and information as to the ore bodies, extent of the development operations, and the disclosures reported. Statements appear of the ore reserves at different periods and the values attached thereto, the quantities of ore dealt with in the past, with the results obtained from the milling operations from start to the month of November, 1912. As to results, there are given the yields, expenses and profits, with the amounts per ton, also the dividends paid by the company. In case the company has investments, where practicable information is given as to the shareholdings. As to the company's own shares, the highest and lowest market prices of a large number of companies for several years past are detailed. Finally, with many properties, where reasonable assurance is afforded of continuity of ore the remaining life of the mine is estimated, generally by the author. With particulars of many of the propositions plans are given showing the location of the properties, the positions of the shafts and plants, and in some cases section plans are given showing the nature of the operations effected and the depths attained in the developments. At the end of the volume there are seven section plans of the Rand, a plan of the Lydenburg field and its geological formation, a geological map of Rhodesia, and a plan of the Tarkwa Banket region of West Africa. The book is published by *The Statist*, and the price is 21s. net.

Kolmanskop Diamonds.

The output of diamonds from this company's property at Luderitzbucht for the month of February was 10,203 carats.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

A Shareholder's Queries.

To the Editor, *South African Mining Journal*

Sir,—Can you kindly give me some information about the "Orange River Colony Brewery Co., Ltd."; original directors, John Nethersole, N. Chiazzari and J. M. Wilson, Durban; and the "Nucleus (New Colonies) Acquiring Syndicate"; directors, H. N. Hemans and Chas. M. Roden, Johannesburg. My brother bought shares in these concerns about nine years ago, and has asked me to make enquiries.—Yours, etc.,

G. W. T.

Voorspoed Diamonds.

To the Editor, *South African Mining Journal.*

Sir,—I beg to inform you that at the special general meeting held this afternoon, the special resolutions passed at the special general meeting held on the 7th inst., ratifying the provisional agreement with De Beers Consolidated Mines, Ltd., and placing the company in voluntary liquidation, were confirmed.—Yours, etc.,

M. MENAMIN,
Secretary to the Liquidators.

Johannesburg, 28th February, 1913.

Government Lease Mines.

To the Editor, *South African Mining Journal.*

Sir,—With reference to the article in your journal of 1st inst., "Another State Mines Scheme," I would like to point out that the term "State Mine," as used therein, is a misnomer. Under the Gold and Base Metals Law of the Transvaal, Section 30, there are three classes of mines: (a) Mines worked on claims which have been pegged out on proclaimed land thrown open for public pegging; (b) mines worked on claims leased direct by the Government; (c) State mines to be developed and worked by the Government under the direction of the Minister of Mines, advised by the Government Mining Engineer. Practically all our gold mines come under class (a). Under class (b) we have the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., popularly known as Government Areas or as State Mines, and the two Government Lease Mines as mentioned in your article will also come under this heading. We have not as yet any mines under class (c), that is, the true State Mines. But as it is not an impossible happening, it would be here that there would be confusion in the significance of the mines, particularly with those who are not so well in touch with the mining industry on the Rand. I would suggest that, at least popularly, for mines under class (b) the generic term of Government Lease Mines would be more appropriate, and that specific terms such as Modder Lease Mine, Brakpan Lease Mine, etc., would lead to less confusion.—Yours, etc.,

H. G. BRICKHILL.

The South African School of Mines and Technology,
Johannesburg, March 3rd, 1913.

Rand Metallurgical Pioneers: An Appeal.

To the Editor, *South African Mining Journal.*

Sir,—I enclose cutting from the *Mining Annual Review Number* of the *Mining Scientific Press* of San Francisco, January, 1913. I am one of the pioneers referred to, who introduced and spent the best part of my life in introducing the cyanide process on the Rand. I started with Mr. Darling on the Robinson Mine and was present with him on that memorable afternoon, December 23rd, 1890, when the first solution was put on tailings in the history of the process, for practical work. We were both employed by the McArthur Forrest Syndicate, and we both relied on promises made to us for our future, by Messrs. W. W. Webster, McArthur, Buckland, and Cawdror James. It was not until June, 1891, that any other employees of the McArthur Forrest process came to the Rand from Glasgow, and they were allotted to us; their names were Adam Dickie, Scrymgeour, and one other whose name I've forgotten. Mr. Dickie was allotted to me at the Nigel Syndicate. In the introduction of the process, we simplified the technical part to an extent which made it possible in July, 1891, to employ untrained labour in charge of cyanide plants. We did this, thinking that our future was assured, a likely assumption when we had the brains to grasp then the importance of the process to the industry, and we accepted a rate of pay equal to an ordinary amalgamator in consequence, otherwise it would have been absurd to accept the rate of pay the mines gave, which in fact we fixed ourselves. At the start of the process, which is now known to be so simple, we lived in the works to perfect it, and for my part I've slept on the extractor boxes, and so did Dickie—we had our hands and arms in the extractor boxes night and day. In the Robinson Mine, Mr. Darling cleaned up the extractor boxes every twenty-four hours for a fortnight; the Syndicate had to assure the banks and themselves of values, we had our arms worried with itching sores. This was the hardest time we had, working night and day to find out how to cut the zinc, smelt the slimes and treat acid ores. There were no books on cyanogen compounds; it was all original research, and with the exception of Mr. J. R. Williams' "Classification of Tailings," and Mr. Betty's "Improvement on Treatment of Slimes," which came afterwards, the process was perfect within a year. The name of the man referred to as having been found dead by the extractor boxes is not mentioned or I would know him, but I am sure "he did his level best." The system of changing managers was not fair to us. When a mining house or a big European bank got control of a mine, all the employees were changed, and if even a good man had no influential friends he could not get work, for the work was simple to learn, and his savings would vanish. So mine. If those who benefited by our hard work—and which of you have not, from the standpoint of 1889—remember that hard work does not allow time to speculate, it will not be much for you to use your influence, whatever nationality you belong to, to let us wind up our time peacefully by providing something, however small, from that tremendous yearly output. I'm sure that no mining camp in the world had better and honester men than we gave the Rand.—Yours, etc.,

THOMAS HENRY EVANS,
Formerly Chemist in Charge of the Geldenhuis Estate
G.M. Co., McArthur Forrest Cyanide Syn.

1601, Call Building,
San Francisco, Calif., U.S.A.,
January 28, 1913.

The extract referred to is as follows:—

> During the year an attempt has been made in the *Johannesburg Star*, and later in the special anniversary number of the *South African Mining Journal*, to raise a fund for the benefit of those pioneers who, having spent the best part of their lives in introducing and taking charge of the working of the cyanide process on the Rand, now find themselves, after over twenty years' service, without provision for their old age which they might have anticipated had the industry not succeeded in upsetting the MacArthur-Forrest patents and thus terminated the interest of the company which alone would have been able to grant pensions to the pioneers. It is not much to ask that in return for the free use of the cyanide process, and the special equipment, such as zinc boxes, designed for this purpose, a small sum per box used should be set aside as the nucleus of such a fund. It is stated that, not long since, an employee bearing an honoured name

in metallurgy, after some twenty years' service in perhaps the richest and most famous mine, was found dead the day after he had received notice to quit. It is hoped this fund will prevent the recurrence of such an incident, which redounds neither to the honour nor the gratitude of the Witwatersrand gold industry.

Geological Truth Tablets.

To the Editor, *South African Mining Journal.*

Sir,—Dr. Mellor, of the Geological Survey, has now made public his views of the geology of the West Rand, the stratigraphy of which, according to the daily papers, is very little different from other doctors of geology who have attempted to elucidate it with the preconceived idea that there is such a bogey as the Witpoortje-break, which is supposed to cut off (?) our Main Reef Series at the Saxon, that was, instead of seeing, as they should see, that it is simply covered with Black Reef Series, of the Black Reef Age, on Witpoortje and Vlakfontein, and reappears again on Reitvlei. That geologists are not sufficiently well posted in our Black Reef Series and its vagaries, such as dipping this way, that way, any way, and being duplicated, etc., all over the country, where Nature happened to have deposited it, with its thirty pebble beds into the bargain, is evident by the fact of their persisting, year in and year out, to call the Randfontein reefs, for example, Main Reef Series, when the pioneers of the Rand know them to be Black Reef Series, and no other. Leaving out that portion of the report on Orange Grove quartzites. dykes, faults, shales, slides, and such like uneconomic "indabas," which cut no ice, as far as the layman is concerned, he "states positively that the Botha Reef is identical with Main Reef, and that the other overlying reefs (some two score odd!) are Kimberley Series"—however that can be explained? I beg, sir, to state, more positively still, that the Botha Reef is not Main Reef, and that all overlying reefs, to which he refers, are of the self-same series, viz., good old Black Reef Series; and that the Black Reef—which is Randfontein's West Reef—and the Randfontein leader, are yet to be found on the West Rand Consolidated Mines, and will make that vast property double its present value. Twenty-five years ago, when I first made a study of Rand stratigraphy out of Nature's illustrated volumes, I observed amongst other geological details, that Main Reef Series was contained in purple sandstones, and Black Reef Series in blue dittos. Later on, I discovered some three hundred miles of unworked Main Reef Series outside the Rand. and, odd to relate, the sandstones thereof have not faded, or changed colour, in all those years. Black Reef Series should have been christened "Blue Reef Series" by the early-day prospectors, as there is nothing black about it, with the exception of the rich ferruginous stringer on the foot-wall of the underlying reef, which is Black Reef proper, and is wrongly termed Main Reef on the East Rand by certain geologists, who certainly should know better. The so-called Main Reef of the East Rand has a shale foot-wall. The Botha has no shale foot-wall, therefore they cannot be identical, as Dr. Mellor says. According to me, and my mine manager friends, no Main Reef has a shale foot-wall, and the Bothas has not a shale foot-wall; yet the Botha is not Main Reef "for a' that!" It is no compliment to the Botha Reef to be called Main Reef, even by the Geological Survey, as Main Reef is only worth 3 or 4 dwts. at very best; and a late well-known mine manager and I (his mill manager) crushed 8 dwts. out of the Botha in the year 1888 for the late Cecil John Rhodes, who first owned it, and with his perspicuity turned it down and kept the West Rand back for years. Dr. Mellor says "the so-called Penwith Reef (Reefs?) is nothing more nor less than the Government Reef Series." As a matter of fact, the Government Reef Series is fully half a mile due west of the Penwith, or the West Rand United shafts, and there is no more resemblance between the one and the other than there is between chalk and cheese. If the Botha Reef is Main Reef, as Dr Mellor says, and "they" all say, then we go back to the old "One-Rand-one-Reef" business, which is destructive geology, as taught by the Geological Society against my two, three, four, five payable series of reefs, which I shall insist upon to my dying day. No wonder the Government claim licences have fallen off to an alarming extent, when the Geological Survey, backed by the Geological Society, proclaim to the world that we have only one payable series on the Rand, viz., Main Reef Series—which, as often as not, is dubbed "the Reef," or "the" Main Reef, by way of belittling these fields, one would imagine. Main Reef Series of the Witwatersrand age is eight miles due south of the Botha Reef at Krugersdorp, and if the group who own the farm it traverses cannot find it by diamond drill, or otherwise, as evidently they cannot, after spending thousands of pounds, I shall be only too pleased to point it out to them, for the Rand's sake, if not their own; as it was through my instigation, previous to the war, that they became possessed of it, and I received from them a few hundred pounds for my services in that regard. How Dr. Mellor makes the twenty odd reefs overlying the Botha Reef fit the Kimberley Series is *marvellous*, and prompts one to the following simple little Cornish verse:—

> There "be" four reefs in the Kimberley Series.
> And three in the Bird,
> To kid "we" that that little lot overlies
> The Botha, is absurd!

I am, etc.,

SCOTT ALEXANDER,
"Rand Stratigraphist."

Johannesburg, March 4th, 1913.

Village Main Reef.

The report of the Village Main Reef for the three months ended the 31st of December embraces the estimated financial position of the company as at the 31st of December, as reflected by the interim balance sheet, working expenditure and revenue account for the quarter, and appropriation account (subject to audit), also particulars of the quarter's development, reduction operations, etc. In the interim (abridged) balance sheet on the credit side sundry assets—shares, stores, live stock, furniture, sundry debtors, and payments in advance—stand at £24,328, investments at cost £147,548, and cash at bankers, value of gold in transit and investments at £353,761. The liabilities as to sundry creditors on account of unclaimed dividends, stores, wages, Government tax, etc., £101,221, dividend No. 24 £165,200, and the balance brought from appropriation account is £377,184. In working expenditure and revenue account the receipts from gold are £255,287, or 40s. 10d. per ton milled. Working expenditure absorbed £114,380, or 18s. 3d. per ton, which left a working profit of £140,907, or 22s. 7d. per ton. Sundry revenue was £12,385, and profit on treatment of accumulated slimes £1,781, against which is a charge for Miners' Phthisis Aid Compensation Fund of £2,353, making the balance carried to appropriation account £152,720. In the interim appropriation account the balance brought forward from the 31st December was £264,464, and the balance of working expenditure and revenue account for the twelve months £513,935, making a total of £778,399. The charges against this sum are Government tax (estimated twelve months) £41,047, French tax (estimated) £7,144, income tax £22,624, dividend account declared in June £165,200, and December £165,200. The balance of £337,184 is carried to the balance sheet as stated above. On development work 122 feet were driven, sunk and risen, exclusive of stopes. The reef disclosures were as follows:—South Reef, distance exposed 73 feet, width 37 inches, assay value 39s. 11d. The reduction works crushed and treated 129,040 tons. The value of ore before crushing (as reflected by mill yield and value of pulp) was 42s. 5d. The total yield was 60,808 ozs. fine, the total yield per ton being 40s. 10d., including accumulations, 7,710 tons treated, yielding 639 ozs. fine. 151,452 tons of ore were mined during the quarter, a decrease of 905 tons on the previous quarter, but owing to sorting having increased from 15.4 per cent. to 17.8 per cent., the tonnage milled shows a decrease of 4,040 tons. The value of the ore mined as calculated from milling value has increased 1s. 11d. per ton. Development footage amounted to 122 feet, of which 73 feet were sampled, the reef disclosures averaging 352 inch-dwts. No estimate is given of the payable tonnage developed for the half-year, as the annual report will state this information for the whole year, together with particulars of the ore reserves on hand.

Mining Questions in the Union Parliament.

In the House of Assembly, this week, Mr. Nicholson (Waterberg) asked the Minister of Mines: (1) Whether his attention had been drawn to the fact that the directorate of the Premier Diamond Mining Company was about to be transferred to London; (2) whether he was aware that Mr. Wagner had resigned from the chairmanship of the directorate, and that he stated: (a) That it was impossible to carry on an undertaking of the importance of the Premier Mine from London; (b) that the company should have responsible people on the spot; and (c) that even such a large holding as that of Barnato Bros. did not give it the right to remove the directorate that had carried on the concern to its present successful position; (3) whether it was in the interests of the taxpayers of the Union, who owned a 60 per cent. interest, that this removal should take place; and, if not (4), whether the Minister had endeavoured, or was making endeavours, to prevent the removal; and (5) whether, in the event of Barnato Bros. succeeding in effecting the removal, he would take adequate measures to safeguard the interests of the taxpayers of the Union. The reply was, generally, that the Government had at present no information of any intention actually to transfer the directorate of the company to London, and it was not anticipated that any attempt of the sort would be made. The Minister could assure the hon. member, however, that the Government was carefully watching events, and would take all steps which might be necessary to safeguard public interests. Mr. Madeley (Springs) asked the Minister of Mines: (1) Whether he was aware that the Van Ryn Deeps and Geduld Mines, on the East Rand, were causing miners to remain underground for excessive periods of time, varying from ten to fourteen hours daily, and, if so, what action he proposed to take; (2) if it was not a fact that on at least one of these mines two skipmen only were employed per shaft per day, working twelve hours each, and men and materials were being hauled on Sundays without a skipman being on duty. If so, did not such treatment constitute a contravention of the Mines and Works Act, 1911; and (3) did the Mines Department intend to proceed against the owners or management? The reply was: (1) That in the Van Ryn Deep Mine a number of men were working over eight hours a day, but in such cases they were working five shifts only, and did not exceed the statutory forty-eight hours per week; (2) at one of the mines in question two skipmen were being employed eleven hours per shift. These hours seemed to the Minister unnecessarily long, and further enquiry was being made. Such men were exempted from the statutory limitation of hours by Sub-sections 2 (b) of Section 9 of the Mines and Works Act; (3) it was evident that under the circumstances mentioned above no action was called for beyond the enquiry which the Minister was having made.

Rhodesian Section.

LATEST MINING NEWS.

The January Output—District Returns—Production for Two Years—Sir John Willoughby on Rhodesian Mining—The Jumbo—Lonely Developments—Charter Trust and Agency.

The total value of Southern Rhodesia's mineral output for the month of January has been officially declared at £236,471, as compared with £260,713 for December. The figures for the two months read as under:—

	December.	January.
Gold	£218,661	£220,776
Silver	1,571	1,401
Lead	731	468
Chrome Iron ...	33,918	8,017
Coal (Sales) ...	5,859	5,809
Total ...	£260,713	£236,471

As will be seen from the foregoing table, the comparatively heavy drop in the total production-value is almost entirely due to the lesser quantity of Chrome Iron shipped during the month: but this is always a varying amount, the effect, as is known, of the irregular shipping arrangements at Beira. The amount of coal sold, which does not, of course, correspond with the quantity actually mined and raised at Rhodesia's one and only colliery, Wankie's, is much the same; while none of the other lesser items call for particular comment this month. But the month's gold production, at 52,455 ozs., valued at £220,776, as compared with December's 51,715 ozs., worth £218,661, is, all the circumstances and notably the drought taken into consideration, quite satisfactory, and gives the industry a rather better "send off" for this year than was the case in any previous year.

* * * *

In the Bulawayo district good returns were sent along by the Agincourt (434 ozs. from 462 tons treated), the Belmont (197 ozs. from 147 tons), Big Ben (386 ozs. from 215 tons), the Fred (456 ozs. from 700 tons), the Susanna (511 ozs. from 903 tons), and the Tuff Nut (381 ozs. from 510 tons), all of these with the exception of the Susanna, operating with plants of 5-stamp capacity or under. The Bucks Reef returned 863 ozs., described as a final clean-up and including accumulated concentrates, preparatory to the property being let on tribute. The Bushtick, on the other hand, appears to be gradually improving its position: this mine's output for the month was 870 ozs. from 6,051 tons treated. And the same seems to be true of the Old Nic, which recovered 1,060 ozs. from 2,214 tons. In the Gwelo district, where the Globe and Phoenix contributes no less than 9,043 ozs. of the district total of 15,995 ozs., the only individual output improvement was at the Csardas, which sent in 492 ozs. from a tonnage treated of 521. The persistent regularity with which this last-named property, owned by the Wolfshall Syndicate, has for many years contributed such fine returns, marks it out as one of the most valuable among the small mines of the country.

* * * *

The Hartley district sent in a total of 12,123 ozs. as compared with December's return of 11,938 ozs., and most of the individual outputs were as good as usual, which is saying a great deal. The tributed Battlefields recovered 469 ozs. from 1,237 tons crushed by two Chilians; the Blue Rock distinguished itself by turning out no less than 231 ozs. from only 25 tons; the return from the Brilliant was 589 ozs. from 700 tons; that from the Glencairn 161 ozs. from 204 tons; from the Kanyemba 449 ozs. from 400 tons; the Oleander 224 ozs. from 331 tons; the Owl 546 ozs. from 1,300 tons; the Pickstone 659 ozs. from 514 tons; the Shepherds 522 ozs. from 625 tons; and the S.[illegible] ozs. from 748 tons. In the Lomagundi district the Eldorado mine is doing as well as customary, and its contribution was 4,424 ozs. from 7,533 tons crushed. The output of the Mazoe district was 2,094 ozs., as compared with last month's 1,683, and a fair return here was contributed by the Thornhill mine—307 ozs. from 785 tons. A table, showing the value of the monthly and annual gold outputs since January, 1911, together with the value of the other minerals recovered, is appended:—

Month.	1911.	1912.	1913.
January	£207,904	£214,918	£220,776
February	203,055	209,743	
March	231,947	215,102	
April	221,296	221,476	
May	211,413	234,407	
June	215,346	226,867	
July	237,517	240,514	
August	243,712	239,077	
September	225,777	230,573	
October	218,862	230,072	
November	211,010	225,957	
December	217,026	218,661	
Total Gold ...	£2,647,895	£2,707,367	£220,776
Other Minerals	242,864	257,230	15,695
Total Value ...	£2,890,759	£2,964,597	£236,471

* * * *

Sir John C. Willoughby, presiding at the ordinary general meeting of the Chicago-Gaika Development Company, held in London in mail week, said that, in common with other markets, the condition of the Rhodesian market during the past 15 months had not conduced to the profitable realization of any of the company's extensive shareholdings, and with the exception of the sale of a portion of their holding in Gaika shares at a substantial profit in the earlier part of the year, the Board had thought it wise, in the best interests of the company, to mark time in this direction. There had been considerable depreciation during the last eighteen months in all shares of the class which the company mostly held, a depreciation the Board regarded as only temporary. During the past two years mining in Rhodesia had been making great progress in an unobtrusive manner, the results of which would now soon appear; and the coming year should definitely demonstrate by a large increase in the gold output the great advance which had been made. Several large reduction plants were now being erected, or were on order, for the various mines, which for the last two years had been doing only spade work and developing on a large scale without contributing an ounce of gold to the general output.

* * * *

The report of the Directors of the Jumbo Gold Mining Co., Ltd., for the three months ended December 31, shows that during that period 9,220 tons were crushed for a yield of 3,431 ozs. The ore reserves at December 31 amounted to 3,364 tons, of an average value of 9·19 dwts. The expenditure amounted to £15,770, and the loss was £1,150.

* * * *

The directors of the Lonely Reef G.M. Co. have been informed by cable of the following details of the developments carried out at the mine during December: No. 8

level south drive, driven from 415 to 450 ft., average width of reef 39 ins., assaying 15 dwts. No. 9 level south drive driven from 185 to 245 ft., average width of reef 64 ins., assaying 1 oz. 12 dwt. The total of 200 ft. driven on the reef in the No. 9 level gives an average width of 67 ins., assaying 2 ozs. 15 dwt. Heavy rain at the mine, dams full.

* * * *

The fifth ordinary general meeting of the Charter Trust and Agency, Limited, was held in London in mail week. Mr. R. H. Benson presided, and in moving the adoption of the report for the year ended November 30 last, observed that the net profit was £70,992, against £63,361 the previous year. Dealing with the investments of the Assets Company, which are gradually being realized, he said that in a few days they expected to declare another 1s. 6d. cash dividend to be paid on debenture stock, which would make 6s. repaid out of the 20s. That dividend was payable, by the terms of the trust deed, 30 days from the date of declaration, and it would be paid as fast as the clerical work could be got through. The assets remaining after that 6s. had been paid out of the 20s., and to represent 14s. per share, or £350,000, were £137,900 of debentures and debtors and loans, £123,500 nominal of shares, 364,000 acres of land, 19 town stands, and 30 mining claims. Of course, shareholders would want to know their idea what that might work out to. He would be disappointed if they did not reach another 10s. It depended mainly on the value of the 364,000 acres. They had a bid of 4s. per acre for about 100,000 acres of land which they were accustomed to regard as their worst land, and they were tempted, but it was found that the land was especially suitable for the growing of tobacco, and they did not sell it. Of course, some of the very best land sold at 10s. and upwards per acre. If they ultimately realized about 10s. per acre it meant that the whole of the capital of 20s. in the pound would be repaid. The report was unanimously adopted.

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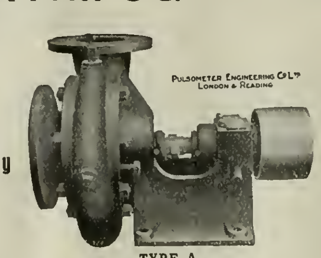

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Transvaal G.M. Estates.

The report of the Transvaal Gold Mining Estates for the three months ended the 31st of December embraces the financial position of the company on the 31st of December, as reflected in the interim balance sheet, working expenditure and revenue account for the quarter, and appropriation account (subject to audit), also particulars of the quarter's development, reduction operations, etc. The interim (abridged) balance sheet on the credit side shows sundry assets: Shares, stores, livestock, furniture, sundry debtors and payments in advance, £36,509, and cash at bankers and value of gold in transit, £155,994. The liabilities are 5 per cent. debentures, £107,592, sundry creditors on account of dividends, debenture interest, stores, wages, Government tax, etc., £49,582, and the balance of appropriation account is £140,119. Working expenditure and revenue account received from gold realised £68,770; profit from accumulations, £4,037; sundry revenue, £990; and interest, £929, making a total of £74,725. Sundry expenses absorbed £6,952, which left a profit for the quarter of £69,774. The interim appropriation account (subject to amendment) includes the balance brought forward from the 30th of September, £88,031, and balance of working expenditure and revenue account as above, £66,774, making a total of £157,805. The charges against this total are: Government tax (estimated) for three months, £6,195; dividend account, £33; expenditure in connection with debenture issue, £8,783; sundry expenditure, £2,675; and the balance of £140,119 carried to the balance sheet as above. Capital expenditure for the quarter, which has been met mainly out of the proceeds of debenture issue, amounted to £10,230 of which £2,675 was met out of profits. The acting general manager reports as follows:—Central Mines—During the quarter under review 1,800 tons were crushed in excess of the previous one, while the total yield per ton showed a decrease of .126 dwt. per ton, the cost being 1s. 6.42d. per ton less, the result being that an increased profit of £2,203 was made for the quarter. The development footage for the period shows a decrease of 1,131 feet, owing to main drives being pushed through to the more payable ground, thus decreasing the points of attack, and, in consequence, temporarily affecting the development footage. The treatment of accumulated slimes is proceeding at the rate of 1,070 tons per month. At the Clewer Mine, the Broken Hill section is nearly worked out, and the available faces in the incline section are limited, the labour being gradually transferred to Duke's Hill South. The Duke's Hill channel is continuing to open up well. At the Peach Tree Mine a considerable amount of work has been done on the reef struck above the incline shaft, but up to the present this work has not fulfilled expectations, with the exception of the drive advancing towards Duke's Hill. Theta Mine has continued to open up as well as ever, and in a crosscut which is being put in below the old opencast on the lower reef we have encountered a good patch, this reef not having previously been developed. At the Graskop Mine there is nothing of importance that calls for special comment. At Elandsdrift Mine the quartz blow continues to yield as well as usual. The power plant was completed, and started up on November 16th, and has given every satisfaction. Development is being pushed towards the dip section with satisfactory results. At the Vaalhoek Mine satisfactory profits have been maintained, and a still further improvement in the extraction has been effected. The neck and river sections continue to disclose good value ore. The debentures of the company having been obtainable at a price below their par value, the directors, in accordance with the provisions of the trust deed, have made purchases to cover the first redemption instalment of £15,000 due on the 1st of April, 1913, and no drawing in respect of redemption will therefore take place. Debentures of the nominal value of £1,408 have been purchased during the quarter on account of the second instalment of £15,000 due on the 1st of April, 1914.

Transvaal G.M. Estates

The following are the particulars of this company's output for the month of February, 1913:—Central Mines: Tons crushed 11,850, yielding 8,242.816 fine ozs. Elandsdrift Mine: Tons crushed 610, yielding 619.886 fine ozs. Vaalhoek Mine: Tons crushed 1,303, yielding 513.346 fine ozs. Estimated value of output, £39,290; estimated profit for month, £24,688.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of February, 1913:—Tons crushed 2,964, yielding 1,431 fine ozs., valued at £5,948; estimated profit for month, £2,382. Note.—Owing to the large quantities of sand brought down by recent floods, the water race to the power station became choked, and in consequence the power was cut off for 5.125 days. While the water race was being cleaned the turbines and machinery have been thoroughly overhauled, and everything is now in good running order.

THE FEBRUARY OUTPUT: GROUP RETURNS.

Features of Month's Work Reflected in Figures.

Rand Mines Group.

The following are the results of crushing operations of the Eckstein companies of the Rand Mines, Ltd., for February:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	31,150	16/11	14,239	£33,229
New Modder. ...	180	7	48,400	20/1·4	23,379	48,570
City Deep	150	9	41,900	24/4·9	18,735	27,329
Village Deep ...	180	7	44,800	20/7·4	16,410	22,650
Village Mn. Reef	220	6	37,400	18/6	15,718	31,139
Robinson	250	6	52,100	14/5·5	24,135	63,574
Bantjes	100	3	25,300	24/2·4	8,981	7,084
Totals & averages	1160	43	281,350	19/7·5	121,597	£233,575

The following are the results of crushing operations of the subsidiary companies of the Rand Mines, Ltd., group for February:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	63,510	17/ 3·5	21,223	£33,829
Geldenhuis Deep	300	7	52,000	25/ 0·9	18,345	11,762
Nourse Mines ...	260	7	49,700	22/ 1·7	18,783	23,730
Ferreira Deep ...	250	7	50,230	20/ 2·1	24,502	52,053
Crown Mines ...	660	26	170,000	17/ 9·8	63,185	113,970
Durban Rood. D.	100	3	23,860	24/ 8·9	8,567	6,465
Totals & av'ges	1870	57	409,300	19/10·5	154,605	£241,809

Crown Mines, Limited.—Owing to shorter month, tonnage milled decreased by 20,000 tons, and working costs increased 10·3d.

The Albu Group.

The February operations of the producing mines of this group were as follows:—

Company.	Stamps.	Tube Mills.	Tons Crushed.	Total Cost.
Aurora West	80	—	13,083	£13,614
Cinderella Consolidated ...	80	3	17,440	23,826
Meyer and Charlton	75	2	13,041	12,387
New Goch	120	4	21,900	20,585
Roodepoort United	50	3	24,713	24,486
Van Ryn	135	6	36,300	28,232
West Rand Consolidated ...	100	4	27,000	33,478
	640	22	156,477	£156,608

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	20/ 9·7	£18,326	£4,712
Cinderella Consolidated ...	27/ 3·9	23,101	*725
Meyer and Charlton	18/ 11·9	32,430	20,043
New Goch	16/ 6·4	27,231	6,646
Roodepoort United	19/ 9·8	20,160	*4,326
Van Ryn	15/ 6·6	51,810	23.578
West Rand Consolidated ...	24/ 9·6	41,606	8,128
		£214,664	£63,107
Less loss			5,051
Net profit			£58,056

* Loss.

Roodepoort United.—The operations were affected by the overwind at the end of January, resulting in reduced tonnage. Costs include expenditure for repairs. The shaft is again in use.

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Engineering Notes and News.

Engineering Expansion.

The continued prosperity in the engineering world of Great Britain is reflected in the expansion of several of the big steel works. From the *Times Engineering Supplement* we learn that Messrs. Edgar Allen & Co., Sheffield, undertook important extensions of their works during the past year. The new shops include a pattern shop, 89 ft. by 18 ft., and a forwarding shop 125 ft. by 49 ft. These are now in use, and the following are approaching completion:—Finishing shop, 181 ft. by 11 ft.; machine shop, 306 ft. by 63 ft.; tool room and stores, 61 ft. by 16 ft.; motor generator house, 30 ft. by 12 ft.; smith's shop, 300 ft. by 30 ft.; fettling shop, 345 ft. by 45 ft.; and annealing shop, 345 ft. by 45 ft. The high-speed steel, tool steel, mining drill steel, foundry, machinery, railway and tramway departments have all been working at high pressure for a long time, and it is hoped that these extensions will enable the company to deal promptly and efficiently with all orders. Messrs. Edgar Allen & Co. have local offices at 5, New Club Buildings, Loveday Street, Johannesburg.

New Electric Plant at the Worcester.

Last month, by invitation of the manager and consulting engineer, local mining people and others visited the Worcester Mine, in order to see the working of the electric plant which has been recently installed on this property. The visitors numbered about thirty, and facilities were afforded for the inspection of the generating station at the "Cataract" Falls, and the distribution of power at the mine and works. Luncheon was provided at the Worcester Hotel. Mr. Michael Dodd, the consulting engineer, presided, and after cordially welcoming the guests, explained the advantages gained by "inspanning" the forces of nature in preference to the generation of power by means either of steam or the more economical suction gas engine. Power generated by suction gas cost the company approximately three farthings per horse-power per hour, while that generated by water power was obtained for less than one farthing. In 1911 the directors of the Worcester Company decided considerably to extend the power plant of their property, and resolved to make use of the water power available at what is known as "The Cataract Falls." The sources of power before this new installation were: (1) The company's original water right: Here by the erection of a dam on the river and a water race to a point opposite the reduction plant, a fall of 55 feet was obtained. At this point of fall is fixed a Vortex turbine, which by means of a direct wire-rope drive, runs the mill, etc., at a distance of a quarter of a mile away. (2) A second water right, known as the Golden Quarry, two miles further up-stream. Here a fall of 46 feet operated a Gunther turbine, which in turn drove, by belt, a continuous current electric generator, and the power so obtained was conveyed to the mine at a voltage of 550. (3) A pair of suction gas engines of a nominal 60 h.p. each, arranged to run either singly or coupled, were some time ago installed as a stand-by, but, owing to the installation of tube mills, and the consequent demand for additional power, these instead of being held in reserve, were kept in constant use. It was with the double object of increasing the power supply, and of cheapening it by utilising to the full the natural sources of power available, that the present scheme was undertaken. The Cataract is slightly over five miles from the mine, at a point where a clear fall of 125 feet is obtainable by means of a water race slightly under half a mile in length. The power to be thus obtained it was decided to transmit at 5,500 volts 3-phase in order to keep the cost of the over-head line and loss by transmission as low as possible. The adoption of a high-tension 5,500-volt supply necessitated the replacing of the generators at the Golden Quarry site by an alternator which could work in parallel with the power available from the new sources of supply. The distance of the Cataract Falls from the mill as the crow flies is 5½ miles, but in order to link up the quarry station and to avoid crossing the summits of the intervening ridges, it was necessary to adopt a route of over six miles for the high-tension transmission line. The contract for the supply of the new plant was entrusted to Messrs. Hubert Davies and Co., of Johannesburg, who also erected the whole of the generating machinery, transmission line, and motors. Mr. D. Wauchope was the engineer who carried out the erection for the contractors.

Brakpan Mines.

The output for February was:—Stamps working, 160; running time, 26 days; ore crushed, 56,010 tons; tube mills working, 8; ore hoisted, 66,399 tons; ore from dump, 1,320 tons; waste sorted, 17 per cent.; fine gold declared, 20,114 ozs.; valued declared £84,709, equal to 30s. 3d. per ton milled; working costs £47,302, equal to 16s. 11d. per ton milled; working profit £37,407, equal to 13s. 4d. per ton milled.

INVESTORS' DIARY.

The following company meetings have been announced:—

March 8.—Sakalava Madagascar Prop. Oil Fields.
March 12.—Worcester Exploration Co., at Worcester, C.P.
March 18.—Cassel Coal Co.
March 19.—Anglo-French Coal Estates.
March 28.—Jupiter, Simmer Deep, Wolhuter, Bucks Reef.
May 21.—Apex Mines; New Kleinfontein.
July 15.—Transvaal Consolidated Lands.

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Automobile Notes.

Rail Motor Coaches.

In the engineering notes of the *Daily Telegraph* of the 20th of January, the writer deals with the Thomas system, which has been introduced on the South African Railways system. One coach is now running between Krugersdorp and Boksburg on parcel deliveries: The article says this system is a marvel of ingenuity, and has proved in practice to bear out its theoretical promise. The engine fly-wheel carries a duplex system of planet pinions, the first smaller than the second, and meshing with a sun pinion, which is keyed to a main shaft passing right through to the driving axle. The larger planets mesh with a sun pinion carried on a sleeve attached to the dynamo armature. When both sets of planets are clutched together the whole rotates bodily, giving direct mechanical drive. When the sleeve sun pinion is locked stationary the large planets travel round it, and the sun wheel on the driving shaft rotates at a reduced speed. Actually an infinite number of speed reductions is obtained between these two limits by taking more or less current from the dynamo armature, thus causing a greater or smaller restraining effort on the armature and sleeve sun wheel. This current is passed to a second electric machine keyed to the driving shaft, causing it to rotate as a motor assisting the effort of the large sun wheel. It will thus be seen that the speed is reduced by transforming some of the work from the petrol motor into electrical energy, which is retransformed into mechanical work at the required lower speed. Moreover, an equal variation of speeds above the mean speed is obtained by using the second machine as a dynamo to assist the first, acting as a motor, to speed up the main shaft beyond the engine speed. Since the electrical portion has never to transmit more than one-third of the power, it can be made small with great saving of weight and expense. The Leyland Company have constructed rail cars on this principle for the Central South African Railways, having 37 ft. 6 in. wheel base, and accommodation for forty-two passengers. The engine is of 120 b.h.p. running at 670 revolutions per minute, and may be accelerated to give 200 horse power. The car will maintain a steady speed of thirty miles per hour on a gradient of 1 in 25, and will accelerate on the level at 1·3 ft. per second, giving a maximum speed of fifty miles per hour.

"Here and There."

It seems more and more clear, the further the matter is viewed, that in benzol lies the solution of the fuel problem as far as England is concerned, and that it is at least hopeful to learn that considerable activity is now being displayed in the great coal centres of South Wales with a view to its production on a large scale.

* * * *

The Home Office has decided that in future at all inquests held in cases of death through traffic accidents, irrespective of the class of vehicle involved, a representative of the Department shall be in attendance. The first occasion arose at an inquest held at Southwark Court recently when it was announced that, with the permission of the Coroner, a Home Office solicitor would attend to watch all such cases,

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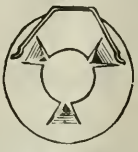
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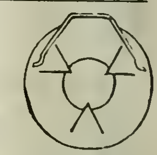
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and to examine witnesses, with a view to obtaining information to be laid before the Select Committee, and to be available for the use of the Home Office authorities. By this means it is expected that data will be collected which will assist largely in determining the causes which make for the present unsafe condition of the streets.

* * * *

A curious position has arisen at Nantucket in America. Some two years ago the authorities passed a resolution excluding motor cars from the island. Recently, however, they purchased a motor fire engine, which has now been delivered. The law, however, does not make any exception in favour of fire engines, and so some of those citizens who are in favour of having automobiles on the island are threatening that if that engine makes its appearance outside the fire station they will have the law on the firemen. In the meantime the fire engine stays at home.

* * * *

The motor industry in the United States is likely to benefit largely by the inauguration of the parcel post service, which it is proposed to conduct with motor vehicles. At first they will be hired, and 500,000 dollars have been allocated by the Postmaster-General for this purpose. Eventually, however, it is the intention of the postal authorities to purchase the necessary equipment. In Germany electric vehicles are now being used for the parcels delivery. The vans are front driven, there being one motor to each front wheel. Entrance to the van is by a door alongside the driver, so that he has complete control over the contents.

* * * *

In the course of a speech at a banquet given by the German Society of Motor Car Manufacturers, in Berlin, Prince Henry of Prussia mentioned that while in England there was one motor vehicle to every 249 persons, and in France one for 111, in Germany the proportion is only one in every 927. Possibly the heavy taxation of motor cars in Germany was responsible for this state of things, but he thought that motor cars should not be taxed higher than other pleasure vehicles.

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Finance, Commerce, and Industries.

African Realty Trust.

The tenth annual general meeting of the African Realty Trust, Limited, was held at the company's offices this week, Mr. I. W. Schlesinger presiding. In dealing with the directors' report and balance sheet, Mr. Schlesinger pointed out that the company's reserve now amounted to over £121,000. The usual dividend of 15 per cent. was declared. The report and balance sheet were adopted, and the retiring directors were re-elected. Mr. Howard Pim was again appointed auditor.

* * * *

A New Oil Company.

The British Imperial Oil Company (formerly generally known as the Sumatra Oil Company), whose leading scene of operations is Aru Bay, Sumatra, Dutch East Indies, is coming back into the South African market, when its agents at Delagoa Bay and Johannesburg will be Messrs. Cotts & Co., at Capetown and Port Elizabeth, Mitchell, Cotts & Co., and at Durban, Messrs. William Cotts & Co. The first South African shipment will arrive in one of the company's own steamers early in April next. It will be an assorted cargo, consisting principally of 35,000 cases of petrol, of which 25,000 cases will be railed direct to the depot of Messrs. Cotts & Co., at Johannesburg. This company, it will be remembered, opened its connection with South Africa in 1906, its agents then being Messrs. Cotts & Co., a store being built at Delagoa Bay for the accommodation of its products. The business continued on these lines for over a year, when, on January 1st, 1908, the company's store and stocks were taken over by the Colonial Oil Company, with Mr. Comerford as its General Manager for South Africa. When the Colonial Oil Company became replaced by the Vacuum Oil Company the latter continued to sell the products of the Sumatra concern, but from April 1st next, as stated, Messrs. Cotts & Co. will act as its representatives. This now makes the third large oil-importing concern which has started operations in South Africa during the past eighteen months or so—the three being the Colonial or Vacuum, the Texas, and the British Imperial Oil Companies.

* * * *

The Dalagoa Bay Coaling Installation.

The amended conditions under which tenders for the providing and erecting of a coal-loading installation are to be carried through as the result of the conversations that took place the other day in Johannesburg between Sir Thomas Price and Mr. Hoy and Major Sa and Mr. H. von Hafe and the representatives of the Coalowners' Association have been distributed to all the previous tenderers, and as Lisbon had already given its sanction to the work going forward on the lines indicated, the successful tenderer will be able to go ahead within four weeks from now. The plant is to have a testing capacity of 400 tons an hour, and must be able to maintain an actual loading capacity of 250 tons, or at the rate of 6,000 tons in the 24 hours. This is very satisfactory indeed; but we may hope that with the gradual increase of the coal export the necessity will soon arise for the duplication of the plant. It has taken nearly five solid years to get Lisbon to the point now reached, and it may be that if the Joint Board had not at last insisted on the local authorities being allowed to proceed, a few more years would have been wasted in fruitless efforts to equip the Port with a plant which is simply indispensable to its reputation and progress.

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Bank Clearing Returns.

The Clearing House returns of the South African banking centres are as follows: Half-year to June, 1912: Totals: Capetown, £11,921,348; Durban, £12,447,361; Johannesburg, £62,574,668; Pretoria, £7,933,218. Monthly returns second half of 1912: Capetown: July, £1,895,485; August, £1,725,526; September, £1,663,571; October, £1,897;812; November, £1,765,866. Durban: July, £1,899,590; August, £1,971,139; September, £1,833,916; October, £2,070,127; November, £2,238,531. Johannesburg: July, £8,417,350; August, £7,467,094; September, £11,170,303; October, £9,748,619; November, £9,923,015. Pretoria: July, £1,107,496; August, £1,118,532; September, £1,040,121; October, £1,035,839; November, £984,024. Pretoria: For half-year ending December 31, 1912, £6,266,011 3s. 6d.; for half-year ending June 30, 1912, £7,933,216 14s. 6d.

* * * *

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Sakalava Madagascar Proprietary Oil Fields, Ltd.

NOTICE OF INFORMAL MEETING,

NOTICE IS HEREBY GIVEN that a Meeting (informal) of Shareholders in the above Company will be held **on Saturday, the 8th day of March, 1913,** in the Board Room, Grand National Hotel, corner Rissik and Pritchard Streets, Johannesburg, at 7.30 p.m. sharp.

BUSINESS:

1. Explanation—Reasons of this Meeting being informal.
2. Directors' Report.
3. To consider the Articles of Association.
4. To consider the Memorandum of Association.
5. And such other business as may be brought forward.

By Order of the Board,
C. W. HERALD, Secretary.

71, Standard Theatre Buildings,
Joubert Street, P.O. Box 2089, Johannesburg.

TELEPHONE 217. Box 2127.

GEORGE McINNES, B.Sc.,

Importer of Electrical Supplies for the Trade.

Sole Agent for the "ARCONA" Metal Filament Lamp.

MARSHALL SQUARE, JOHANNESBURG.

ESTABLISHED 1892.

MARTIN BUDD,

Landing, Shipping and Forwarding Agent,

DELAGOA BAY.

P.O. Box 90. Telegraphic Address: "BUDD."
Codes: A.B.C., A.1., Watkins & Scott's.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Diamond Cutting Enquiry.

We understand that the Select Committee on diamond cutting begins its sittings on the 18th inst., and that Messrs. Imroth and Ross Frames will give evidence on behalf of the Premier Company. Sir David Harris and Mr. Francis Oats will appear for De Beers. It is understood that Sir Thomas Cullinan was subpoened, but will not give evidence. The Press will not be admitted to the enquiry, but an official verbatim report of the proceedings will be published later.

* * * *

An Interesting Experiment.

One of the first fruits of the visit of Mr. Alfred Lewis to Australasia has been the introducing of Melbourne capital to South Africa. It appears that the alluvial expert, Mr. W. T. Anderson, has been loaned to Mr. Lewis, and he is now examining our alluvial deposits, which are low grade, and not too favourable to low working costs, but are worth sampling with a view to working. Owners of gravels containing tin or gold should take the opportunity of having their properties examined by an experienced adviser, whose reports are backed up by the necessary capital for development. A guarantee for the necessary financing is given with each favourable test.

* * * *

Village Deep.

The new electrical hoist at the western shaft of the Village Deep came into operation a few days ago, and is now running satisfactorily. It is, we understand, intended to close down the old eastern shaft in so far as the hoisting of ore is concerned, and to use it for dumping ore down to the 16th or main collecting level, where the mechanical haulage is now running very satisfactorily. Transport and hoisting operations are gradually being concentrated around the No. 3 or Turf Mines shaft, which will, of course, for the future handle the greater part of the tonnage from this mine. The 20th level is being approached. The mine is in a very sound position as regards development, and is likely to do much better things in the future than so far have been achieved.

* * * *

National Diamonds.

The additional capital required by the National Diamonds Company for the enlarged scheme of operations, in accordance with the advice of engineers who have examined the property, is said to have been provided. Mr. Pollard, who has had a distinguished record for work at the Premier Diamond Mine, has been appointed manager, and the necessary crushing plant is on order.

* * * *

Banket in Western Australia.

In a useful and well-compiled bulletin (No. 50) of the Geological Survey of Western Australia, which deals concisely with the geology and mineral industry of the whole State, Mr. A. Montgomery, M.A., F.G.S., the State Mining Engineer, refers to some conglomerates of Devonian Age as follows:—"In the Devonian system we have a very interesting series of auriferous conglomerates (the Nullagine Conglomerates), which are in many respects closely analogous to the 'bankets' of South Africa, and it is interesting to note that in these beds the gold is pretty certainly of alluvial origin, derived from the erosion of the underlying Mosquito Creek and auriferous greenstone series, both of which teem with auriferous veins."

* * * *

Tube Mill Liners.

The directors of the Tube Mill Patents Consolidated, Ltd., announce that their company has now purchased the Transvaal patent rights of the Osborne tube mill liner, and all applications regarding the rights to instal these liners should be made to the agents of the company, Messrs. Greig & Wilkinson, P.O. Box 2154, Johannesburg. This company now controls the patent rights of a number of proved inventions in respect to tube mill liners.

New Gwanda Producers.

The Gwanda district of Matabeleland, although it has suffered considerably in both revenue and reputation through the closing down of the East Gwanda group of mines, is still engaging a good deal of local interest in Rhodesia. Two Gwanda mines of some importance have recently entered the productive stage. One of these is the Champion Reef, now owned by the Amalgamated Properties of Rhodesia, and the other is the Kameel. In this latter proposition the New Rhodesia Mines, Ltd., holds a half interest.

* * * *

Rooiberg Minerals.

The Secretary of the Rooiberg Miners Development Co., Ltd., writes:—" I am instructed to communicate the following report from the consulting engineer, dated 12th March, 1913: ' As requested by the board, I beg to report on the general position of your mine as follows: The conditions in the underground workings remain as usual and call for no comment. Exploration and prospecting work continues to give most highly satisfactory results. The ore reserves are as follows: (1) Ore reserves, 22,600 tons; (2) indicated as available from supplementary fillings, from lodes in excess of reserves (No. 1), and from prospecting and exploration work, etc., 90,300 tons; (3) accumulated partly treated products, 36,000 tons; (4) ore at grass, 2,600 tons; total ore and partly treated products as at 31st January, 1913, 151,500 tons, or, say, at least four years ahead of the mill on a basis of 3,000 tons per month. All these reserves, together with the accumulated partly treated products, are in value equal to the present average grade, namely, 3·5 per cent. to 4 per cent. metallic tin. The tin dressing plant has run without hitch or trouble since it commenced work; the extraction results are already well up to what was expected of the new installation, and are improving month by month. Additions and improvements, where economically possible, are being made from time to time.' "

* * * *

Technically Educated Workers.

At the end of a long review of " Modern Metallurgy on the Rand," by H. S. Gieser, which appears in the *Mexican Mining Journal*, the writer refers to the question of the dearth of technically educated men on reduction plants along the reef, both in the higher and minor portions. After describing the ineffectual attempts to meet the difficulty, he gives as a reason, not usually mentioned, for the failure of these attempts, the unattractive rate of wages offered. Another reason not given is that £10 a month is not attractive to the class of men with a technical education, or those that have it in them to educate themselves. Especially when it is considered that £7 a month on the average mine on the Rand is deducted for board, room, or sick benefit, and recreation hall dues, and a good Kaffir on the surface gets £3 a month clear of all expenses. However, the learner system is a success for reducing wages, and on the principal groups all men applying for work on reduction works are hired at the head office at from £10 to £12 a month regardless of age, education or experience. As a consequence experienced men leaving a property are frequently compelled to leave the country."

* * * *

An Opinion of South Africa.

Sir John Hewett has spent 35 years of his life in the Government service in India. On his return home, he visited the Transvaal and other parts of South Africa. He was struck by some resemblances, as well as by some glaring differences between India and South Africa. " For one thing (he said) South Africa is depending too much on its mineral resources and too little on its agriculture, while India, on the other hand, is depending too much on its agriculture and too little on its mineral resources." " There is one thing India and South Africa have in common (added Sir John), and that is the political difficulty of how to treat the native population, though even here there are some differences. In South Africa, there is one white man to every 400 or 500 natives, but in India (including the 75,000 men of the British Army) there are fewer Europeans than are to be found in the City of Johannesburg. There are 3,000 natives to every white man in India, and the task of controlling them is increasing in difficulty every day."

* * * *

" Compound " Shafts.

It is noteworthy that in the course of his paper on the Crown Mines, reviewed elsewhere in this issue, Mr. R. C. Warriner said:—" In my opinion, a vertical to incline shaft is one of the poorest institutions we have on the Rand. After a few years' use such a shaft becomes very expensive to maintain, and very inefficient. The Robinson Central Deep shaft gave an enormous amount of trouble owing to the high speed of hoisting necessary to raise the requisite tonnage, and the small amount of time available for repair work. Twice in the year 1910 it was necessary to practically stop all work in that section of the mine for a period of nearly three weeks, in order to thoroughly retimber and strengthen the bend."

* * * *

Chartered Finances.

The report of the Chartered Company gives interesting figures as to revenue and expenditure. The following table contrasts the results secured under these headings since the beginning of 1910. The figures as to Southern Rhodesia are:—

Year to Mar. 31.	Estimated Revenue.	Actual Revenue.	Estimated Expenditure.	Actual Expenditure.	Estimated Deficit or Surplus.	Actual Deficit or Surplus.
	£	£	£	£	£	£
1910 ...	565,560	620,243	592,497	614,405	*26,937	† 5,838
1911 ...	671,000	773,269	708,868	752,067	†62,132	†21,202
1912 ...	793,900	808,602	850,467	837,805	*43,433	*29,203
1913 ...	832,800	—	905,658	—	*72,858	—

* Deficit. † Surplus.

Income from the Company's property excluded.

A supplementary statement for six months to September 30, 1912, compared with corresponding period of 1911, indicates continuance of set-back, and results since, consequent on the drought, are likely temporarily to add to discomfort. With decline in revenue " some of the less urgent services for which provision has been made may be postponed."

	1911-12.	1912-13.
Revenue, April-September .	£382,333	£366,225
Expenditure, April-Sept. ...	364,394	426,658
+ Surplus or – deficit ...	+ £17,939	– £60,433

The Northern Rhodesia deficit continues large, but revenue is gradually increasing. The expenditure, though also increasing, was to some extent exceptional in 1911-12, consequent on capital outlays in connection with the fusion of North-West and North-East Rhodesia to north of the Zambesi. The figures, consolidated as to 1910-11, contrast as under:—

Year to March 31.	Revenue.	Expenditure.	Deficit.
1911	£97,475	£176,693	£79,218
1912	116,921	190,128	73,207

* * * *

The Price of Tin.

In their metal report, dated Liverpool, February 17th, Messrs. H. A. Watson & Co. remark with regard to standard tin:—" There has been some persistent ' bear ' selling during the past fortnight, and at one time the cash price touched £219 10s., but it recovered quickly, and up to £224 10s. cash was done on the 10th inst., since which the market has again ruled lower, down to £220 10s. being done on Friday, closing easier to-day at £220 cash and £216 15s. three months. There are many pessimistic rumours about, the present level being considered too high for the intrinsic position. English tin is in good demand, but the outlet for Straits is largely restricted owing to the slackness of the tinplate trade here. America is only buying sparingly, and there is room for improvement in that direction. The position is dependent to some extent on the outcome of the Balkan trouble, and if this were satisfactorily settled, we should certainly see an improvement in the demand. The shipments from the Straits this month are estimated to be 5,500 tons. Bolivian: Values nominally £170 to £195 per ton, according to quality. English: Ingots, £223 to £224 per ton."

* * * *

A Plea for the Mining Industry.

At the annual dinner of the South African Institution of Engineers last Saturday night, Mr. John Munro, President of the Chamber of Mines, in responding for the mining industry, said that he had been connected with both diamond and gold mining. For that reason, he particularly welcomed the visitors from the Diamond Fields, in whose industry the mechanical engineer was top dog. He reminded the gathering that in 1893 a writer predicted that before the end of the century the Rand would produce ten million pounds' worth of gold. Let them contrast that with the fact that in 1912 the Rand produced £37,000,000 worth. He felt confident that there would be a steady increase in the output for many years to come, and for any loss in the outcrop, the deep levels would compensate. It was suggested that all the profits should be spent in development, and here came in a conflict between the technical advisers and the shareholders. In these circumstances the directors' position was not a bed of roses. In his own mind the gold and diamond mining industries were the principal supports of the country, although he admitted that in time agriculture would probably overwhelm them. But that time had not yet come. And then, if there were legislation that would adversely affect the mining industry, such mines that were only just paying their way must go under. If more burdens were thrown on the industry many more mines must close down. The result would be a dislocation of trade and an enormous amount of distress from unemployment. He spoke feelingly on this matter, because there were rumours of more legislation on the lines he had indicated. He implored legislators to think twice before they did anything to impose more taxation on the mining industry. Laws that would frighten away capital would lead to the crippling of the gold industry and of the many side industries that were dependent upon it. He strongly protested against the apparent dead-set against gold mining. If that dead-set were successful, the day would not be far distant when the Government would seriously regret its action.

* * * *

A Macequece Prospect.

We learn that there is a scheme afoot to float a property named the Mac New, situated about five miles north of Macequece and close to the Rhodesian-Portuguese East African frontier. The property consists of 20 claims, and is traversed by the old Macequece-Chimezi transport road. The geological features of the district are stated to be crystalline schists striking north-east and south-west, and representing a continuation of the belt of schist formation which enters Portuguese territory from Umtali via Penhalonga. A small amount of prospecting has been carried out, but such work as has been achieved is considered to disclose very promising results. It is stated that four quartz reefs have been proved to exist within a zone of 132 feet in width. Two of these reefs, we understand, show a width of 7 feet. The assay values obtained indicate distinct profitable possibilities. There are good facilities for cheap working, and it is estimated that an expenditure of about £3,000 would be sufficient thoroughly to prove and develop the property preparatory to the erection of reduction plant. Both Messrs. Hans Merensky and W. T. Hallimond have, we believe, reported favourably on the proposition.

TOPICS OF THE WEEK.

CENTRALISATION AT THE CROWN MINES.

Mr. R. C. Warriner's paper on the Crown Mines centralisation scheme, read before the South African Institution of Engineers last week, is certain to become a classic of its kind. It presented the case for amalgamation from a new side, that of the engineer, and it brought home to the practical man the benefits of centralisation in a way not possible to the economist or mere man of figures. Perhaps the most valuable portion of the paper was Mr. Warriner's concluding study of the effect of centralisation on costs, and, as we may not print all the paper in justice to the Institution, we have given elsewhere that portion of Mr. Warriner's contribution in full. His conclusions will be found moderate and convincing; and an incontrovertible argument in favour of the big step taken in 1909. It will be remembered that the amalgamation known as the Crown Mines, Ltd., was projected in the early months of 1909, and came into actual existence on the 1st of July of that year. At the outset of his paper, Mr. Warriner gave an idea of the various properties of which the combination was formed, the extent to which they were equipped, the area to be exploited, and the methods by which it was sought to work the whole to the best advantage by the centralisation of underground and surface operations. Details of the most important and interesting features were then given, with cost and efficiency where practicable, and although the completion of the programme is of too recent date to allow an accurate judgment to be made of the full value of such centralisation from the economic standpoint, yet he showed what has been accomplished so far in this direction. It will be readily understood that in order to convert the property into one large workable mine, it was necessary to so lay it out as to centralise operations as far as possible, both on the surface and underground, having regard not only to those properties already developed and equipped, but so as to enable the large area of deep level ground to the south to be worked as economically as possible. It was also imperative to so conduct the future development operations as to bring all ore to as few shafts as possible, as, if the old shafts and equipment were all to be made use of, the cost of production would tend to increase rather than to diminish. The programme, therefore, was confined to the following main objects, as summarised by Mr. Warriner: (a) The concentration of underground shovelling and tramming. (b) The hoisting of rock through two well-equipped shafts only. (c) The leading of underground water to one large pumping plant as far as possible. (d) The undertaking of advance development on a large scale for the purpose of economising in future development costs and for facilitating the rapid opening up of the ground both above and below the South Rand dyke. (e) The concentration of surface work by means of—(1) central offices; (2) central workshops; (3) a railway system for transport of rock, stores, etc.; (4) two new crusher stations; (5) one new reduction plant. Taking each of these aims in the order mentioned, Mr. Warriner related what had been achieved. Space, however, will not permit of our quoting here his detailed descriptions. An excellent method has been adopted throughout the recently developed portion of the mine to effect a saving of labour in shovelling and tramming and to assist in the concentration of ore. The backs between any two given levels are split up (so that the maximum distance to be shovelled in a stope is about 100 feet, and the average about 50 feet) by a system of small ore chutes at an angle of 55 degrees to the level below. The truck used in the stope is a 20 cubic feet well bottom truck, which has to be run through a tippler to be discharged. It may be asked if this system is not so expensive in initial costs when compared with self-acting planes, small hoists or shaking chutes, as to prove prohibitive. Mr. Warriner's reply is that with the scheme of advance development on a huge scale, blocks were laid out of such dimensions east and west that the cost of such installations became more or less negligible. For example, the cost of the necessary development work in crosscuts and ore chutes works out at about 1d. to 1·5d. per ton for the block of ore so served, and once the system is installed the maintenance on the ore chutes is nil, the only cost being the maintenance of trucks and tracks. It is noteworthy that it is too early yet to formulate a definite scheme for the development of the area south of the South Rand dyke. Should the dyke prove to be in the position anticipated, the lower ground will probably be developed by two main inclines south of Nos. 5 and 7 shafts respectively, and feeding into the main crosscuts south from those shafts on the 19th level. It will also probably be necessary to sink two vertical shafts south of this dyke for the purpose of proper ventilation. In order to do away with the numerous small equipments for the transport of ore from the shafts to the crusher stations, and from these stations to the mills, it was decided to tie up all the important points on the property with one elastic railway system, replacing by this system three continuous rope haulages, one electric haulage, one small steam haulage, and tail and skip haulages between the crusher stations and mills at the Crown Deep and Langlaagte Deep respectively. Although the installation of this railway proved very expensive, it is undoubtedly the main factor of elasticity in the entire surface plant. By its aid, ore from either of the new crusher stations can, if necessary, be delivered into any one of the three principal mills, and general stores, machinery and explosives can also be readily distributed to the main points on the property. To continue the use of the former equipment would naturally have proved expensive, and it was decided to confine the hoisting of rock to Nos. 5 and 7 shafts, equipped for handling the entire tonnage on day shift only, and to build at each of these two shafts a new crusher station. The one at No. 5 shaft has a capacity of 6,000 tons, and the one at No. 7 a capacity of 5,000 tons in ten hours, which is sufficient to keep the mills running continuously, whilst the crusher stations are run on day shift only. This large capacity of shafts and crusher stations has been provided for the purpose of giving greater elasticity throughout, and to make it possible for shafts and winding equipment to be thoroughly examined and kept in repair without loss of tonnage. "I feel sure," said Mr. Warriner, "that the provision is a wise one, as I have never yet been connected with a property on the Rand where a sufficient margin was allowed in this direction." The total capacity of the plants is 715 stamps with a monthly crushing capacity of 232,000 tons. Some of the more important features of the equipment were explained in detail by Mr. Warriner; and this portion of his paper was enriched by valuable details of cost and efficiency. Some more of these figures will appear in our next issue; and it is enough here to state that they throw valuable light on several important controversial questions. For the reasons set out by Mr. Warriner in another part of this issue, the Crown Mines amalgamation has not yet realized its full economic possibilities; but there can be no question of its already proved value. As Professor Lawn remarked in commenting upon the paper, Mr. Warriner might well have asked for a further year's trial before attempting to appraise the fruits of amalgamation. That he did not do so bespeaks his belief in the fact that the scheme has even already justified itself.

THE E.R.P.M. REPORT.

With commendable promptitude the directors of the East Rand Proprietary Mines have issued the annual report and accounts relating to the operations of the company for 1912 sufficiently early to enable shareholders to consider the statements contained therein with such care as the circumstances demand. It is perhaps unnecessary to say that the part of the annual report which is likely to claim most attention from the shareholder and the public generally is that which relates to the ore reserve position. In spite of the heavy loss which resulted from the policy and methods which were the objects of the official enquiry of last year, the condition of the mine in the matter of ore developed was even a greater subject of anxiety. The ruthless elimination of a large percentage of so-called ore reserves, which Mr. Ross Skinner found himself obliged to effect, and the admittedly inadequate number of the development faces made the question of reserves one of extreme urgency. There have evidently been difficulties in the way of that progress which was contemplated at the beginning of last year, for whereas at the end of December, 1911, the ore reserves were estimated at 6,716,605 tons, of a value of 6·9 dwts. over 55 inches, they were at the end of December, 1912, according to the report to hand, estimated at 6,013,300 tons of a value of 6·8 dwts. over 54 inches. In addition to this, there were some 561,955 tons which were not sufficiently opened up to admit of valuation, but including this quantity also, it will be seen that milling has gained to some extent on development. As explained in the manager's report, work was greatly hampered both in the Driefontein and Cason sections of the mine, and the labour position, probably never quite satisfactory, became very acute in the winter months. The necessity of reorganising the underground policy of the company and the disadvantageous conditions under which the undertaking had to be commenced, doubtless contributed largely to the number of the obstacles which beset the new development scheme at the beginning and continued to surround it during the whole year under review. It is gratifying to find that, although the reef disclosures at the Comet were not as satisfactory as those of the previous year, the values disclosed at the three other sections of the property were better than during the year before, the indications of value in the lower workings of the Cason being more promising than for some time past. The conclusion to be drawn from the figures recorded is, obviously, that although there is nothing to justify great elation with regard to the position of things underground, there is at the same time no apparent cause for a feeling of depression. Another question which inevitably falls to be discussed is one which has more than once been alluded to in a prominent way in various financial papers, and has been referred to pointedly in the *S.A. Mining Journal*. At the beginning of last year, after the new *regime* had acquired control, one of the first consequences of the newly inaugurated policy was a marked advance in the recovery per ton milled. Having taken occasion to sound the best sources of information with regard to this feature of the output, we were assured, it will be remembered, that the higher grade of the milling ore was the result of a well and judiciously thought out working plan, and that there was no reason to assume that the plan was misconceived. With regard to this matter, the General Manager, Mr. W. T. Anderson, is sufficiently explicit. "The underground staff," he observes, "have used every effort to ensure cleaner mining, with the result that stoping widths were reduced, chiefly by the elimination of waste rock, from an average of 67 inches in 1911 to an average of 53 inches for the year under review. This factor alone represents an increase in the grade of over 5s. per ton. In addition, 75,000 tons of worthless rock which had to be hoisted were sent direct to the dumps, and 9,000 tons of very low grade rock from development faces were packed direct into old stopes. The increased grade of ore mined for the year can generally be accounted for as the result of the policy outlined above." It is interesting to note that a lay-out scheme, more in accordance with the economic advantages presented by such a large claim area, and more conducive, therefore, to lower working costs, has been devised for the property. The concentration of hoisting to two main vertical shafts, as is proposed, and the gradual abandonment of the present incline shafts as the spheres of working become greater in depth, should, as the General Manager remarks, prove of considerable advantage in the future working of the mine. With regard to the extracts from the balance sheet and the other financial details quoted from the directors' report, which appear in another part of this issue, little need be said. They speak honestly and reassuringly enough for themselves, and make it abundantly clear that the best and wisest counsels have been followed by those who control the purely commercial side of the enterprise. All concerned can, we think, look forward to the next annual meeting with confidence and equanimity.

AIR PRESSURE IN WITWATERSRAND MINES.

Conditions To-Day and a Few Years Ago—An Improved Position—Plenty of Room for Further Betterment—Overhauling of Pipe Lines Advocated.

In few branches of underground work has such an important improvement taken place in the past three or four years as in regard to air pressures. The tonnage broken by machines is vastly greater to-day than at any previous time in the history of the industry. There are, in the first place, an infinitely larger number of rock drills at work, actual statistics showing that whereas in 1908, 2,425 drills were employed, there were in use last year 5,530, or considerably more than double the number in use four years previously.

Small Machines and Pressures.

The number of machines at work has been largely increased by the extended employment of small machine drills, for whereas in 1908 and previous to that date stoping drills were few in number, there are hundreds of the smaller types of rock drills in use right along the Reef to-day, and the employment of machines of this type continually is extending. We may be pardoned for referring to the important part played by this journal in the development of stope drill practice on the Witwatersrand, since it was largely due to the Stope Drill Competition, which we organised at the Robinson Mine in 1907, and to the subsequent contest of the Chamber of Mines, that the great scope for employment of small drills existing on the Rand was given serious consideration and organised experiment. The competitions, too, served to direct attention to the very important question of air supply and the effect of high and low air pressures. It is generally admitted that the comparatively poor performances of several machines, both large and small, on the Witwatersrand a few years ago, was largely attributable to insufficient air pressure, and it is, too, now pretty widely recognised that the better drilling records of to-day are largely the result of the delivery of more air at the working faces. Not so long ago it was an open secret that underground pressures on the Rand left a great deal to be desired, and that what with pipe lines badly laid and much too small, with leakages and inadequate compressor power, the majority of the machines were working under most unfavourable conditions. Some drills—large tappet drills, for example—will do a certain amount of work satisfactorily with air of even 30 or 40 lbs., though they would, of course, have a higher duty with a higher pressure. Others, however, demand high pressure—60 to 100 lbs.—for anything like satisfactory performances. The small drills, as a class, call for higher pressure than large machines, and of the former the hammer type generally requires higher pressures than the reciprocating pattern. Many makers of hammer machines ask, we believe, for 100 lbs. and over for good results.

Position in 1908 and To-Day.

Four or five years ago the majority of the mines on the Rand were working with air at less than 60 lbs. pressure at the machine. It was recognised that to carry the standard up to 75 or 80 lbs. would be a costly business, both as regards capital outlay and mining charges. But it was also realised that by raising the pressure the work achieved would be enormously increased, and it is to the credit of the industry that conditions to-day are substantially better than they were in the days of the Stope Drill Competition.

Our Own Enquiries.

We have been at some pains to discover what the average air pressure obtaining at working faces in the mines of the Main Reef is to-day. At one Central Rand deep level, where we made enquiries during the week, we were told in one drive that 75 lbs. was being obtained, and we were informed that 70 lbs. and over was developed by most of the machines running in the mine. Undoubtedly a considerably higher average pressure is, taking the Rand as a whole, being obtained, but it must not be inferred that 75 lbs. is the average right along the Reef. As a matter of fact about 60 lbs. is probably the average from Randfontein to Geduld, and obviously there is still room for much improvement. A leading engineer, when asked for his opinion on the subject, remarked "Yes; it is quite true air pressures have gone up. Particularly has this been the case amongst mines in the immediate vicinity of Johannesburg, which have benefited by the power stations at Rosherville and the Robinson Central Deep. But on the eastern and western limbs of the Reef pressures are still at many mines very low, and I am quite sure that the working costs of the mines in question could be substantially decreased were the air pressures raised. The trouble at many mines is that not sufficient air is generated; at others the pipe lines are much too small, and since the friction in transmission of compressed air power is high, and particularly high in small pipes, the delivery at the face is remarkably low. Pressure gauges in the engine-room and in the shaft afford no indication whatever of what the delivery of air at the face is. Many engineers and managers, who imagine that machines are running at 75 lbs. would be very surprised to know what the actual pressure at the face is. I believe that practically every mine on the Reef would find it good business to overhaul their air pipe lines. Of course more air will be available when the new compressor power plants are in operation.'

The New Air Stations.

The additional air capacity referred to will be obtained from three 7,000 kilowatt steam-driven turbo air compressors at Rosherville, which will constitute the largest air compressors erected. At present there are six steam-driven turbo air compressors of 3,500 kilowatts each at Rosherville, and six electrically operated turbo air compressors of 3,250 kilowatts each at the Robinson Central Deep. By the end of March, 1914, the combined capacity of the air compressor plants will be 61,500 kilowatts, and a further improvement in air pressure at the working faces should be noticeable. The tendency appears to be to break more and more ore by mechanical means, and it would therefore appear incumbent on the technical directors of the industry to see that the pipe lines at many properties, which are notoriously defective in this respect, are thoroughly overhauled or renewed in preparation for the advent of this increased driving power.

The Windhuk correspondent of the Reuter South African Press Agency writes:—According to a private communication from the South, a certain diamond company has pegged off 15 prospecting fields. Gold, it is stated, has been found on the Huib high level, about 25 kilometres to the west of Huns. A railway to either Brackwater or Sieheim is being projected, should the working of the fields prove profitable. The production of diamonds for the year 1912 was 1,025,000 carats, and it is anticipated the 1913 figures will be considerably higher.

Pretoria Copper and Tin Fields.

The seventh ordinary general meeting of the Pretoria Copper and Tin Fields, Ltd., was held this week at 107 Exploration Buildings, under the chairmanship of Mr. D. Symons. The directors' report, which stated that during the year no work had been done on any of the company's properties, was adopted. Messrs. J. Fraser and D. Symons were re-elected directors, and Mr. W. R. Moon was elected auditor.

THE BRAKPAN-SCHAPENRUST LEASE.

Government Re-offers the Ground on Somewhat Modified Terms—More Liberal Treatment Indicated.

Elsewhere in this issue appears a second Government notice (contained in the *Union Gazette* of March 14th), bearing date March 8th, and dealing with the lease of mineral rights of a portion of the farm Brakpan No. 16 conjointly with the mineral rights of the farm Schapenrust, both in the Boksburg district. The obvious inference is that no tenders in strict conformity with the terms cited in the Government notice of October 21st, 1912, have been received, and accordingly the properties in question have been re-offered on a somewhat modified basis. On a first reading, the new notice appears to be identical with the notice of October 21st.

Important Differences.

The amounts due to the Government under the sliding scale are notably the same in each instance, but on a close reading of paragraphs 16 and 20 in each notice it becomes evident that the Union Government is prepared to treat applicants somewhat more liberally in return for the provision of the large sums of capital necessary for the development and equipment of these large deeper level areas. In the original notice paragraph 16 read as follows: "Each application shall be accompanied by an undertaking from a banker of standing that he guarantees the applicant in a sum of sixty-five thousand pounds (£65,000) sterling, which amount shall be payable by the banker to the Government on demand until the Government is satisfied that the funds required for the adequate working of the proposed amalgamated property have been provided. The said sum shall be forfeitable to the Government if the successful applicant fails to provide the said funds within a period not exceeding two (2) months after the acceptance of the application." In the new notice section 16 reads: "Each application shall be accompanied by an undertaking given by a banker of standing to the effect that such banker guarantees that he will pay to the Government a sum of sixty-five thousand pounds in the event of the application being accepted and the applicant contravening or failing to comply with any of the conditions herein set forth or any other conditions which he has agreed to fulfil or comply with." It will be observed that in the amended lease under section 16 there is no specific reference to penalty in the event of the funds required for the adequate working of the property not having been provided by the successful applicant within two months of the acceptance of the application. In this connection paragraph 11, which reads the same in each instance, may be quoted: "Within a period not exceeding two (2) months after acceptance of application, or such further period as the Minister of Mines may allow, the successful applicant shall form a company with limited liability, registered and having its head office in the Transvaal. Such company shall be provided with at least the cash capital required for shaft sinking and preliminary development, and shall thereafter, when required by the Minister of Mines, furnish the additional cash capital needed to bring the property to the full producing stage. The owners of the mineral rights on Schapenrust shall have the right and shall be bound to subscribe at par for fifty thousand (50,000) of the shares in such company." Presumably the Government, without substantially amending the obligations which will have to be shouldered by the successful applicant, is prepared to grant indulgence in the matter of time elapsing between registration and provision of funds.

Section 20.

Now as to section 20. The original lease read: "The consideration to be quoted by the applicant as payable to the Government for the lease shall take the form of a percentage of the annual profit of the amalgamated property." In the amended notice the concluding paragraph is: "20. The consideration to be quoted by the applicant as payable to the Government for the lease shall preferably take the form of a percentage of the annual profit of the amalgamated property." The distinction between the two is the inclusion of the word "preferably" in the latest document, an inclusion which would seem to indicate that the Government is prepared to accept remuneration in another form to that agreed on in the Modderfontein Gold Mining Areas lease. Possibly something in the nature of an annual rental will be tendered and accepted. The sum and total of the new notice appear to be that it has been clearly brought home to the Government that those who assume the tremendous responsibilities involved in connection with a venture like the Brakpan-Schapenrust lease and who provide the large sums of money necessary require more liberal terms and less onerous restrictions, especially during a time of money stringency, than were offered and required in the original official notice.

Mining Questions in the Union Parliament.

In the Assembly this week, Mr. Creswell (Jeppe) asked the Minister of Mines: (1) When the Sunday Observance Commission held its last sitting for the hearing of evidence; (2) whether the report of the Commission had been received, and, if so, when it would be published; and, if not (3), what was the cause of the delay in the presentation of the Commission's report? The Minister of Mines stated that the last sitting of the Sunday Observance Commission for the hearing of evidence was on October 26. The report of the Commission had not yet been received. The Chairman reported that further information was still being received by the Commission which was of importance, and must receive consideration in view of the fact that the subject matter of the Commission's inquiries was of great importance from a social and financial point of view. Mr. Madeley (Springs) asked the Minister of Mines: (1) How many applications for miners' phthisis compensation which were one week old and over, and which were not finally dealt with, were in the hands of the Secretary of the Miners' Phthisis Board on March 1, 1913; (2) how many hours each day and how many days per week did the Board sit to consider applications; and (3) whether the Minister was aware that the majority of applicants were in straitened circumstances, and urgently needed speedy settlement of their claims. The Minister of Mines replied that the number of applications for compensation in the hands of the Board on the 1st inst. over one week old, which required to be dealt with, was 703. The Board sat on an average four hours a day and five days a week. The answer to the third part of the question was in the affirmative. The Board was doing everything it could to deal promptly with the applications, but naturally there was at first a large amount of arrear work to be overtaken.

New tin deposits have lately been discovered in German South-West Africa, between Ebony and Spitzkopje, at a considerable distance south of the direct line Spitzkopje-Erongo. The *Berg und Hüttenmannische Rundschau* describes them as similar to the tin occurrences which are now being opened up in the Erongo granites, the matrix being pegmatite (coarse grained granite), occurring in fissure veins. Samples derived from the new deposits have given high values, but, as yet, too little is known about them to form an opinion as to their payability. The geographical position of the new finds obviously points to the probability that the tin-carrying area between Erongo and Spitzkopje extends much further south than has hitherto been believed.

THE MANAGER AND STAFF OF THE VILLAGE MAIN REEF.

Front Row: C. Bawden, S. Muirhead, C. C. Perring, juniors; W. G. Downard, clerk; L. R. Fergusson, sampler; P. H. Davies, assistant assayer.

Seated: F. A. Shand, surveyor; A Murrish, mine captain; J. Chilton, mine captain; J. H. Stevens, mine secretary; H. Warren, assistant manager; R. Rame, manager: W. Calder, engineer; Q. J. Leitch, cyanide manager; R. G. Bevington, battery manager; J. G. Blackmore, chief assayer; J. H. Mader, assistant secretary.

First Row (standing): B. V. Blundun, foreman tube mills; J. Watson, shiftboss; S. A. Lowe, assistant surveyor; C. Black, sampler: G. Reed, draughtsman; C. F. Bulman, timekeeper: W. T. Starkey, timekeeper; W. J. T. Hall, foreman smith; T. Moore, shiftboss; H. G. Bertram, chief timekeeper; W. R. Clark, assistant compound manager; J. R. Trollip, foreman cyanide works; J. Wilkinson shiftboss; W. R. Sennett, foreman mason; A. J. Green, timekeeper; H. Glasson, shiftboss.

Second Row (standing): G. C. Coyle, chief storekeeper; P. Freedman, sampler; W. Burke, sampler; H. W. Caldecott, native inspector; B. W. Fenton, timekeeper; H. E. Burnett, timekeeper; W. S. Gordon, assayer; C. H. Baker, smelter; J. H. Sheeldrake, assistant storekeeper; J. Polige, boss trammer: H. Godwin, shiftboss; J. W. Osterlaak, shiftboss; M. Macfadyen, foreman fitter. P. J. Smith, foreman cyanide works; J. Cormack, foreman carpenter; J. Gardner, foreman fitter.

LATEST DESIGNS IN MILL AND CYANIDE PLANTS.

Constructional Work on the Rand and in Rhodesia—Probable Future Types—Still Higher Stamp Duties Expected—No Disposition to Substitute Rolls—Cyanidation of Gold Ores Up to Date.

The past year or two has witnessed something in the nature of a lull in regard to reduction plant construction in South Africa. All the large Central, East and West Rand amalgamation schemes have been consummated, and, with the exception of the Further East area, there is not much prospect of further large additions to milling and cyaniding plants for the next year or two. That the mining properties situated to the east of Boksburg will, in the course of the next few years, have at work a very much larger complement of stamps and tube mills than at present are in use, is common knowledge, but a considerable amount of further development is necessary before anything approaching consummation of milling plans in this field is attained.

Present Activity.

At present constructional activity is limited to the Van Ryn Deep, where 80 stamps and eight tube mills are in course of erection, and at Geduld, where enlarged plant will be in operation in about two months' time. As announced in our last issue, the Brakpan Mines Company is about to erect an additional forty stamps and two tube mills. The stamps, which for the present will be employed as alternatives to tube milling, will come into operation towards the end of this year, whilst the two new tube mills are expected to be at work in about a couple of months' time. At a later date the Modder Deep Levels, Springs Mines and other ventures will attain to the productive stage, whilst one or two mines at present crushing in this area are likely to increase their plants in the not far distant future. So much for the Rand.

The Position in Charterland.

In Rhodesia much more activity in regard to new plants is to be observed, and construction is now proceeding on about half-a-dozen propositions of importance. Rhodesian ores, as has frequently been remarked in the columns of this journal, offer far more scope for metallurgical enterprise than those of the Witwatersrand, and a number of decidedly interesting features are to be observed in the designs of these Rhodesian reduction and treatment equipments. The extension of the fine grinding policy, combined with filter pressing, may be said to have revolutionised (we use the word in a moderate sense) metallurgy during the past year or two, and it is worth observing that in regard to both these developments Rhodesia has been quick to take advantage of their effective applicability to a number of Rhodesian ores. Nissen stamps and Dorr thickeners are amongst the metallurgical devices favoured in Rhodesia to-day for new plants. On the Rand both these appliances are employed—four Nissen stamps being at work in the City Deep mill, whilst a Dorr thickener was included in the City and Suburban's new plant. We understand, too, that in future mills or extensions of mills erected along the Main Reef series, more extended use will be made both of Nissen stamps and the Dorr slime thickening patent. In both the new Rand and Rhodesian equipments a tendency to even higher stamp duty than at present is obtained, is to be observed. The Van Ryn Deep's stamps will have a falling weight of 1,900 lbs. apiece, and are expected to maintain a 20-ton duty. The record duty for gravitation stamps is, however, likely to fall to the credit of the Shamva Mine at Abercorn, in Mashonaland. There will be 56 Nissen stamps, each of 2,000 lbs. falling weight, and eight tube mills. It is expected that this equipment will crush about 50,000 tons per month, so that the duty will be in the the neighbourhood of 35 tons per head per diem. Other mines in Rhodesia which are being equipped with Nissen stamps are the Kimberley Reef and Falcon—the former with six of these stamps, which are expected to mill 3,000 tons per month, and at the latter the capacity will be 15,000 tons per month. In addition to Nissen stamps, the equipment at the Falcon, which is a gold-copper venture, will include concentrating and sintering plants, blast furnaces and convertors. The Cam and Motor plant will be of decided interest, since it will consist of ball mills, tube mills and roasting and slimes plants, and will in some respects be very similar to the equipments erected on a number of Western Australian properties. The mill for the Antelope Mine, situated to the south-west of Bulawayo, will be of somewhat similar design to that of the Cam and Motor, and will contain ball mills, roasting plant and ten grinding pans.

Filter Presses.

Apart from Nissen stamps and roasting furnaces, the installation of filter plants is a feature. The Shamva Company is installing a gravity plant of 1,000 tons per day capacity, and on the Witwatersrand a gravity plant of 900 tons per day capacity for the Van Ryn Deep and a pumping plant (500 tons per day capacity) for the Geduld Proprietary Mines are under construction. All these orders go to show that, as with tube mills, the gold mines of the Sub-Continent are never slow to adopt new ideas and devices from other fields. It is, in fact, scarcely drawing on the imagination to foresee at an early date the reorganisation of treatment plants erected only four or five years ago, and representing at that time the most modern and effective gold treatment plants existent. One may, in fact, truly say that the last word in mill and cyanide plant construction is never spoken.

Nothing has occured since we ventured the prediction that rolls were unlikely to replace stamps to make us amend that prophecy. The next new mill that is erected on the Rand will in all probability contain stamps as the primary crushing machine, but not in all likelihood of ordinary Californian gravity type.

Latest Methods of Cyanidation.

As to cyanide plant, the scheme of treatment to be adopted at the Shamva may be regarded as representative of the latest South African practice. Here the pulp, after leaving the stamps, will gravitate to the feed cones of eight 22 feet tube mills, using Osborne liners; the underflow of the cones will pass through the tube mills, over short copper plate and blanket tables, and thence to a centrifugal pump to be elevated back to cones again; the overflow of the tube mill cones will pass direct to eight sand cones superimposed over four others, in which the sand will be classified out, and, mixing with the barren solution from the slime plant extractor boxes, will gravitate to eight 50 feet by 8 feet 6 in. sand collecting and leaching tanks, in which the sand will be leached, washed and deposited on the dump by rope haulage in the usual way. Slime and solution overflowing the sand cones will flow to five 35 feet by 10 feet Dorr thickening tanks, part of the clear overflow of which will run to the extractor boxes and a portion back to the mill supply tank. The thickened pulp from the discharge of the Dorr tanks will be pumped up to five 45 feet by 10 feet Pachuca tanks, connected in series, where, after air agitation, the slime pulp will run to the storage agitators connected to the Butters' filter plant. The latter plant will consist of 336 leaves and will be designed on the gravity system of working. All solutions will be precipitated in ordinary zinc extractor boxes and the gold slime smelted in two Morgan gas-fired furnaces.

New Heriot G.M. Co.

The following are the returns for last month's operations at the New Heriot Mine: Tons milled, 10,600; ounces recovered, 4,634; profit, £8,006.

THE GEOLOGY OF THE WESTERN RAND.

Some Economic Bearings of Dr. Mellor's Recent Paper—The Country South-West of Roodepoort—A Review of the Middelvlei Fragment Theory—The Witfontein and Bertha Estate Reefs Series.

Our attention has been drawn to a *lapsus calami* in the account of Dr. Mellor's paper on "The Geology of the Western Rand," which appeared in the issue of the 1st inst. In a reference to what Dr. Mellor has named the Saxon fault, it was stated that "The Saxon fault dips south-westwards, and the contact between the Main Reef series and the plane of the fault in depth would tend to the south and thus well to the west of that ground which was riddled by boreholes put down some time ago by the Goerz group." What was intended to be written was that the fault dips towards the south-east, and that the contact between the plane of the fault and the Main Reef series would tend to the south and thus well to the east of the country prospected by Messrs. A. Goerz & Co., Ltd. This error would doubtless be self-evident to anyone who knows the area in question, and obviously a fault striking south-west could not well dip in the same direction. The conclusions of Dr. Mellor with regard to the existence of the Roodepoort and Saxon faults are clearly of no small importance in their bearing upon the prospects of a line of country which has been held by claimholders with considerable tenacity and abundant hope for many years past. The hitherto prevailing ignorance of the existence of the Roodepoort fault and its effect upon the structure of the country directly to the south-west of the Princess Estate properties has been shown to have led to no small amount of confusion. Occurring as it does between the harder rocks of the upper Witwatersrand system and the softer strata of the immediately following Jeppestown series, which lies at the top of the lower Witwatersrand system, the contact appears to be a normal one, and the various banket beds which overlie the Main Reef series, and have been brought successively into conjunction with the Jeppestown beds along the south-western extension of the fault, have been mistaken for fragments of the richer gold-bearing series. This circumstance forms a striking comment upon the claim which is made by many prospectors that experienced persons can without much difficulty discriminate between one banket series and another by a mere inspection of the pebbles and cement.

Upper Witwatersrand System.

Since the upper Witwatersrand system is of necessity moved to the eastwards in depth, and since, moreover, the banket reefs abut against the fault instead of bending round in a more or less parallel direction with it, as has hitherto been assumed, it is evident that any attempt to discover the Main Reef series in depth anywhere near the contact between the upper and lower Witwatersrand systems through Rietvlei and Luipaardsvlei, is pretty well doomed to failure. The Goerz boreholes, which were congregated near the common corner beacon of these two farms, where claims were held by the Colmar Syndicate and other owners, were, according to Dr. Mellor's mapping, in a particularly unpromising locality. Beyond this area, again is that of the Midas Deep, where there was supposed to be distinct evidence of the existence of the Randfontein, or Main Reef series. There is, to be brief, a broad band of country, immediately to the south-east of the former South Randfontein Deep claims, which may be anything up to four or five miles in width, within which the results of prospecting for the Main Reef series, even at a depth, are likely to be extremely disappointing. Dr. Mellor is to be congratulated upon the intelligible solution of those geological problems which until now have been dealt with in a hesitating and very inconclusive sort of way. Dr. Carrick, who was deeply concerned in the solution of these problems, was content to leave the country unexplained, under the comprehensive title of the "upthrust area."

The Middelvlei Fragment

"If Randfontein and Botha's series be identical," remarks Dr. Carrick, in his well-known report on the property of the Western Rand Estates, Ltd., "the next important question is the nature of the fragment of reef series which is exposed in various cuttings and as outcrop in the Consolidated Gold Fields portion of Middelvlei. As will be seen on my map, this fragment occupies approximately the same stratigraphical position in relation to the Government Reef series as the Randfontein series, and may be regarded, on this account alone, as a most probable continuation of that series. When in addition to this identity in stratigraphical position, therefore, we find such a highly characteristic bed as the Boulder Reef occupying the same position in the relation to both Randfontein series and the Middelvlei fragment, and consider, moreover, the character of the reef fragment itself, viz., a large, medium and small pebble series, there can remain little doubt about the identity of this fragment with the Randfontein series." The Boulder Reef, it may be explained, was described by Dr. Carrick as a local peculiarity of the Main Reef series, which had been opened up 400 feet west of the reef series on Randfontein. The report continues: "If the Middelvlei fragment then is Main Reef series, there can be little doubt about the extension of that series on to Gemsbokfontein, Venterspost and further, but it may well be asked whether the results obtained from the fragment on Middelvlei justify any great expenditure in the direction of prospecting for its extension." Since the results had been notoriously indifferent, the report went on to suggest that it was doubtless only an instance of local impoverishment. Upon the basis of the theory regarding the Middelvlei fragment was built the conclusion—No. 9 in the report—"That the extension of the Main Reef series almost certainly traverses the properties of the Western Rand Estates in a south-westerly direction." Dr. Hatch was engaged to investigate the data gathered by Dr. Carrick, whose work, it may be added, was most carefully and conscientiously done, and the views of the former in regard to this Middelvlei fragment are thus recorded in a report in which all his colleagues' statements are accepted and approved: "Dr. Carrick has fixed the probable position of the Main Reef series by reference to certain well-defined beds, such as the Government Reef series and the uppermost bed of the magnetic shale, which he terms Hospital Hill shale (from its occurrence above the Hospital Hill at Johannesburg). These beds he has traced from Roodepoort to Randfontein and thence to Middelvlei. I have followed these beds with him, and have come to the conclusion that his identification of the Government Reef series on Middelvlei is correct. The Randfontein or Main Reef series must be looked for in the hanging-wall side of the Government Reef, and, I believe, with him, that the reef outcrops which occur at about the centre of the farm Middelvlei, near the dam belonging to the Consolidated Gold Fields, should be regarded as a fragment of this series, and that, beyond the point, they are concealed beneath the dolomite formation on Venterspost and Gemsbokfontein." The evidence collected, in a word, was so clear that it needed little more than a walk over the ground to bring conviction to an expert mind that the Main Reef series was heading directly for the Western Rand Estates property. With such encouragement as this the company could have no hesitation in making preparation for a considerable expenditure in exploratory work, and the directors and all concerned were naturally much elated when borehole results seemed to give additional confirmation of the views of the geologists.

So much so, that when the capital was increased in 1909 from 270,000 shares of 10s. each to 405,000 shares of 10s. each, the additional 135,000 shares were taken up by shareholders at 20s. per share. Since then some rather expensive shaft sinking operations in watery strata have been undertaken, and discontinued owing to difficulty in dealing with the water. According to the latest published information, the company had on the 30th June, 1911, a floating debt of about £18,000. In view of these circumstances, it is somewhat interesting to find that the Middelvlei fragment, upon which the hopes of the Western Rand Estates, Ltd., have no doubt been mainly based, is, according to Dr. Mellor's mapping, a fragment of the Elsburg series, and that as far as can be discerned from geological data, the boreholes put down by the company are more likely to be in the Kimberley series than in the Main Reef series.

THE WITFONTEIN SERIES.

There was little or no opposition made by geologists to the theory which placed the Main Reef series in the middle of Middelvlei, but it became necessary to account, also, for the alleged existence of Main Reef series further to the west on Rietfontein, Witfontein and Hartebeestefontein, where the Langebrink ground was situated. It is unnecessary to go into all the geological reasoning which was employed to demonstrate the value of the "Langebrink line," as it was called, except to say that "folding" was called in to simplify matters. Still more recently, when the discoveries near Potchefstroom aroused a local *furore* and led to claim pegging on an extravagant scale, the theory of the existence of the Main Reef series on Witfontein and the adjoining farms to the north-east and south-west was again brought to the front. This Main Reef theory was not supported in any way by either Dr. Carrick or Dr. Hatch, however, who in their earlier reports had spoken of the reefs as the Witfontein series, and considered them as "a local development due to conditions of sedimentation which did not prevail elsewhere on the Rand." Dr. Mellor has come to the conclusion that these bankets belong to the Promise series, the difference of opinion being due to the want of agreement in regard to a bed which is considered to be the West Rand shale by the latter, and the Hospital Hill slates by the previous observers, to whose names also may be added that of Mr. A. R. Sawyer in this connection. Whatever be the real facts of the case, it seems clear that the Main Reef theory of the Langebrink engineers must fall to the ground. It has indeed been already repudiated by Mr. Laurie Hamilton, who was at one time induced to give it some support.

Much might be written on the economic aspect of Dr. Mellor's recent conclusions with regard to the Western Rand, as apart from their purely geological aspect, but what has already been briefly discussed will suffice to show that they are of very far-reaching importance. The paper itself will doubtless be published in time to facilitate discussion at the next meeting, and, since its author may depart from the Rand at an early date on a leave of some months' duration, it may be hoped that advantage will be taken of his presence on the Rand to make such objection to his readings as may appear necessary.

THE EFFECT OF CENTRALISATION ON COSTS AT THE CROWN MINES.

Valuable Comparison Before and After Amalgamation.

THE following is the concluding portion of Mr. R. C. Warriner's paper, read before the South African Institute of Electrical Engineers last week:—

"In concluding this paper, I would like to lay before you a brief study of our own experience of the effect of centralization on costs, which I hope will be of interest. To begin with, I should like you to especially remember that the case for centralization is very much better than it actually shows, in that two of the smallest units (the Langlaagte Royal and Paarl Central), which are being worked under centralization, were not worked before. Had they been working at the time, the pre-amalgamation costs per ton would have been much higher, probably 1s. 6d. higher at least in total. Let us first examine the costs in June, 1909, and January, 1913. The figures in total are as follows:—

	June, 1909.	January, 1913.
Tons milled	137,753	190,000
Total working cost	£107,460 16 0	£161,218 19 0
Cost per ton milled ...	15 7·2	16 11·6

As the centralized plant only commenced operations in August last, it is too early yet to show full results. When the maximum tonnage is reached, and when we have been running as a centralized unit for a year or more, we may expect lower costs still. However, an analysis, even at present, is of interest. From the above comparison it will be seen that costs in total are actually higher now by 1s. 4·4d. per ton milled. This increase is after taking into account those economies which we can definitely reduce to figures, such as savings in (a) workshops; (b) pumping; (c) transport from shafts to crusher stations and mills, sorting and crushing, and reduction (milling and cyaniding). Let us examine these economies in detail:—

(a) *Workshops.*—Although workshops costs are not yet down to the minimum running basis, owing to the fact that construction work has only just been completed, still in January, 1913, they amounted to 1s. 2·45d. per ton milled, as against 1s. 4·18d. during the six months previous to amalgamation, thus showing a saving of 1·73d. per ton milled.

(b) *Pumping.*—At the time of amalgamation the total pumping costs per month amounted to about £4,222, or 8·03d. per ton milled, while the average for October-December, 1912, was £2,480, or 3·52d. per ton milled. It will thus be apparent that although we are now pumping the Langlaagte Royal and Paarl Central and deep level water in addition to what was being pumped previously, we are saving £1,742 per month, or 4·53d. per ton milled.

(c) *Surface Transport, Sorting and Crushing, and Reduction Costs.*—A departmental analysis of these costs is shown in exhibit "JJ." From this analysis it will be seen that during the month of December, 1912, we sorted 7,632 tons more and transported to the mills 37,874 tons more than before amalgamation, and that the monthly cost has been reduced by £760, in spite of these additional operations. It will also be seen that the total cost of milling and cyaniding is £467 less, notwithstanding the treatment of an additional tonnage of about 39,000 tons. A summary of the results shown on exhibit "JJ" may be concisely shown as follows:

	Average Monthly Costs prior to Amalgamation		Costs for December, 1912.		Reduction in Cost per Ton Milled.
	Total. £	Per Ton Milled.	Total. £	Per Ton Milled.	
Sorting & crushing	3,091	5·47	2,920	4·00	1·47d.
Surface transport	1,617	2·86	1,025	1·41	1·45d.
Milling	13,235	1 11·41	14,016	1 7·22	4·19d.
Cyaniding	12,347	1 9·84	11,099	1 3·22	6·62d.
Tons milled ...		135,668		175 000	
Tons sorted ...		14,513		22,145	
Tons transported to mills ...		135,626		173 500	

The actual savings so far accounted for since amalgamation are therefore seen to be: Workshop costs, 1·73d. per ton milled; pumping costs, 4·53d. per ton milled; sorting and crushing costs, 1·47d. per ton milled; transport to mills costs, 1·45d. per ton milled; milling costs, 4·19d. per ton milled; cyaniding costs, 6·62d. per ton milled; total, 1s. 7·99d. per ton milled. Having shown that working costs have been reduced in the departments above-mentioned to the extent of 1s. 7·99d. per ton, and that in spite of this the total working costs are now higher than they were before amalgamation, let me endeavour to explain the reasons for such increase. They may be summarised as follows: (1) Relative increase in development footage; (2) increase in sorting percentage; (3) increase in cost of native wages, recruiting fees and compound expenses, caused by competition; (4) cost of sand filling; (5) additional water service underground for allaying dust; (6) miners' phthisis insurance fund; (7) difference in system of mining; (8) the introduction of an eight-hour day underground. Taking each of these factors in turn:—

Development Footage.—In June, 1909, 2,678 feet were developed for 137,753 tons milled. Equivalent for 190,000 tons milled would be 3,694 feet; actual development for January, 1913, was 3,798 feet; relative increase for January, 1913, 104 feet; relative increase at £3 per foot, £312, which is equal to ·4d. per ton milled on 190,000 tons.

Sorting Percentage.—The percentage sorted on the surface in June, 1909, was 9·846 per cent., and in January, 1913, 12·874 per cent., while the tonnage mined in January was 226,198. Had 9·846 per cent. only of this tonnage been sorted, 198,517 tons would have been sent to the mills, and after allowing for the difference in bins, 196,667 tons would have been milled, at a cost of 16s. 4·7d. per ton milled, as against the actual cost of 16s. 11·6d. January costs would then have been lower by 6·9d.

Native Labour.—As before mentioned, owing to competitive recruiting, the cost of native wages, recruiting fees, etc., have increased steadily, as shown in the following comparison:—

	Cost per Shift worked.	
	June, 1909.	January, 1913.
Wages	1/9·2	2/0·1
Recruiting fees and compound expenses	10·1	1/1·9
Totals	2/7·3	3/2·0
Increase per shift	6·7d.	

In January, 1913, 247,142 shifts were worked by underground natives on working expenditure account. The increase per shift of 6·7d. represents an additional expenditure of £6,900 or 8·7d. per ton milled on 190,000 tons.

Sundry Increases.—

	June, 1909.	January, 1913.	Increase per Ton Milled.
Sand filling	Nil.	£1,300 3 9	1·6d.
Water service underground	Nil.	1,231 13 1	1·6d.
Miners' phthisis insurance	Nil.	573 12 10	·7d.
Totals	Nil.	£3,105 9 8	3·9d.

Difference in System of Mining.—Just before amalgamation a great deal of Main Reef footwall mining was being done in both the Crown Deep and Crown Reef sections, whereas now there is practically none in the Crown Deep and very little in the Crown Reef. A comparison of fathomage broken, in relation to total tonnage mined, just before amalgamation and during January, 1913, shows as follows:

	A. Total Fathoms Broken.	B. Calculated Tonnage Broken in Stone Faces.	C. Total Tons Mined.	% B. is of C.	Tons Mined per Fathom Broken.
March, 1909... ...	6,724	112,696	152,826		
April, 1909	6,174	99,996	140,584		
May, 1909	6,635	108,548	151,936		
June, 1909	6,890	113,445	149,676		
Totals	26,423	434,685	595,022		
Average per month	6,606	108,671	148,755	73%	22·5
January, 1913 ...	11,885	189,598	220,198	86·1%	18·5

Had the stoping widths and the percentage from footwalls, etc., been the same in January, 1913, as in March to June, 1909; in other words, had the same tonnage been available for every fathom broken, the total tons mined in January would have been 267,112 tons, or 47,214 tons more than actually resulted. It is difficult to estimate to what extent this comparative loss of tonnage has affected costs for the latter period, but I think a very conservative figure would be 1s. 8d. per ton milled.

Introduction of Eight-hour Day Underground.—This change in conditions is a very important one indeed, and although it is naturally impossible to calculate its actual effect in money it is clear that the loss of time in the underground work of a large body of labourers must have resulted in considerable increase in working costs. If we allow 6d per ton for this increase, I think we shall again be on the conservative side. Let us now summarise the extent to which working costs have been increased owing to differences in conditions for the two periods compared. These are:—(1) Relative increase in development footage, ·4d. per ton milled; (2) increase in sorting percentage, 6·9d. per ton milled; (3) increase in cost of native wages, 8·7d. per ton milled; (4) cost of sand filling, 1·6d. per ton milled; (5) additional water service underground for allaying dust, 1·6d. per ton milled; (6) miners' phthisis insurance fund, ·7d. per ton milled; (7) difference in system of mining, 1s. 8·0d. per ton milled; (8) the introduction of an eight-hour day underground, 6·0d. per ton milled; total, 3s. 9·9d. per ton milled. We find, therefore, that if we make due allowance for changes in conditions, i.e., had the January, 1913, operations been conducted under pre-amalgamation conditions, our costs in January, instead of being 16s. 11·6d., would have been 3s. 9·9d. less, or 13s. 1·7d. At that figure they would have been lower than the costs of June, 1909, by 2s. 5·5d. (15s. 7·2d. less 13s. 1·7d.), which can be taken as a conservative estimate of the saving since amalgamation. I have already shown you that in the costs of workshops, pumping, sorting, surface transport and reduction we have actual figures to prove a saving in those departments of 1s. 7·99d., and the difference between that figure and the theoretical saving of 2s. 5·5d. is accounted for by a great decrease in the cost of shaft maintenance, and economies in other directions in which no separate accounts have been kept. Taking the theoretical saving since amalgamation, which, as before shown, amounts to 2s. 5·5d. per ton milled, we find that on a milling basis of 200,000 tons per month this amounts to £24,500 per month, or roughly £294,000 per annum. It may naturally and rightly be argued that portion of this saving in costs is due to increased scale of operations, but inasmuch as this enlarged scale would not have been practicable had each of the individual units continued a separate existence, I think it may be fairly claimed that the economies effected are due to the amalgamation, which rendered possible the centralized organization of which I have endeavoured to give you some idea. Finally, I may say again that it is too early to see the full fruits of the programme which has been carried out. It must be remembered that we are fully equipped with a milling capacity of 232,000 tons per month, and that every extra thousand tons crushed per month until that capacity is reached will bring down our costs. It is not unreasonable to conclude that a study of the position in a year's time will show savings far in advance of those which I have been able to point to in this paper."

"The Jumpers" G.M. Co.

The following is the result of the joint working of "The Jumpers" and Treasury Mines during last month:—Sixty stamps, working 23 days, crushed 5,430 tons, yielding 1,585 ozs. fine gold from mill, 828 ozs. fine gold from tailings by cyanide, 192 ozs. fine gold from current slimes, and 372 ozs. fine gold from accumulated slimes; total from all sources, 2,977 ozs. fine gold; value of output, £12,505; joint profit for the month, £2,004; position of joint gold reserve at end of month, 771 ozs. fine gold.

EAST RAND PROPRIETARY MINES, LTD.

Annual Reports of the Directors and Superintending Engineer—The Policy of Reorganisation—Reduced Working Costs Anticipated.

The report of the directors for the year ended 31st December, 1912, states *inter alia*, that the net profit for the year amounts to £909,108 9s. 1d., which, with the sum brought forward from the previous year's balance sheet, viz., £151,273 6s. 5d., and the sum of £14,311 0s. 11d., transferred from reserve to appropriation account; and £4,004 0s. 5d., representing difference between nominal value of debentures purchased and cost thereof, makes a total of £1,078,696 16s. 10d. This has been applied as follows:—Dividends Nos. 14 and 15 of 12½ per cent. each, £611,474 5s.; profits tax, £75,059 4s. 8d.; Union Government undermining rights annuity, £7,566; expenditure on plant and equipment, etc., £64,175 0s. 11d.; nominal value of debentures purchased, £53,300; balance of debenture issue expenses written off, £68,712 4s. 11d.; total, £880,286 15s. 6d. Balance of appropriation account—Cash assets (stores, foodstuffs, sundry debtors, etc.), £134,092 9s. 2d.; cash (after providing for current liabilities and the development suspense account). £64,317 12s. 2d.; total, £198,410 1s. 4d. Grand total, £1,078,696 16s. 10d. Debentures.—In view of the strong financial position of your Company, and the price at which the above securities were quoted in the market, your directors, bearing in mind that the annual drawings commence on the 1st March, 1915, deemed it advisable to effect purchases from time to time. Purchases to the extent of £53,300 were executed at an average price of £92 7s. per cent. The debentures acquired have been cancelled. Your Board has decided to write off the whole amount of the debenture issue expenses, amounting to £128,212 4s. 11d. This has been done by utilising £59,500 standing to credit of "Premium on Shares Account" in last year's balance sheet; while the balance of £68,712 4s. 11d. has been charged to appropriation account in this year's accounts. Expenditure on authorised votes, 1912.—In connection with the Superintending Engineer's estimate of expenditure, placed before you last year, amounting to £297,500. Votes to the aggregate of £295.559 were authorised. The actual expenditure incurred during the year amounted to £215,685, leaving a balance of £79,874. Owing, however, to the saving effected on certain closed votes the unexpended authorised balance carried to 1913 is £73,122, representing incompleted work in progress. The surplus of cash in hand at the end of the year, amounting to £64,317 12s. 2d., after providing for current liabilities and for development suspense account, is available to meet the unexpended balance. The allocation of the year's expenditure, viz., £215,685, is as follows:—Machinery, plant and buildings, £45.892; reduction plants, £48,920; property, quarters, etc., £21,281; shaft, including Hercules vertical shaft and underground equipment, £99,592; total, £215,685. Expenditure to be authorised, 1913.—The Superintending Engineer estimates that votes to the extent of £146,000 will be required for the year 1913. The details of these requirements are set forth in his report. In the opinion of the Board this expenditure is necessary and will be authorised. Mine development account.—The amount of 3s. (three shillings) per ton milled, which it was agreed to charge in the working costs for current development, provided a sum of £277,208, of which £149,529 was actually expended. The balance of £127,679 has been placed to a development suspense account and is available for future increased development The charge of 3s. per ton will continue for the present.

The Superintending Engineer's report states, *inter alia*, that on the whole the results for the year are satisfactory. A comparison with the results of preceding years would be misleading on account of the alteration in the system of distributing working expenditure referred to in last year's report. The recovery from the treatment of current ore (i.e., excluding revenue from the treatment of accumulated slime) amounted to 32s. 1d. per ton, as compared with 25s. 4d. for 1911. The increase is attributable generally to cleaner mining, reduction in stoping widths, closer sorting, etc., referred to in the General Manager's report. Working cost for the year amounted to 20s. 10d. per ton milled,. including 3s. per ton charged for development. The actual amount spent on development was £149,529, or 1s. 7d. per ton milled; the balance of £127,679, or 1s. 5d. per ton milled, remaining at the end of the year to the credit of development suspense account. Development.—Owing to the trend of the Wit Deep Dyke being through the Driefontein Mine, development operations in the western section were restricted on account of the inadvisability of intersecting this dyke until an adequate pumping plant is installed. This matter was referred to in last year's report. Although debarred from full operations in this, the higher grade section of the mine, the considerable total of 57,440 feet of development was accomplished, and in addition, 516,655 cubic feet of sundry excavation work. The tonnage disclosed amounted to 1,774,631 tons, of which 1,029,106 tons or 58 per cent. were payable with the gratifying average value of 8.2 dwts. This tonnage of payable ore developed was less than required to maintain reserves, but, considering the enforced curtailment of operations, may be looked upon as satisfactory. The shortfall, as already mentioned, is provided for by the balance of £127,679 standing to the credit of development suspense account which is available for development work when conditions underground permit of expansion. Ore reserve.—A thorough investigation of the developed ore in the mine has been made during the year, and the result shows the ore reserves at the 31st December, 1912, to be—Main reef, 343,119 tons, 5.3 dwts. value, 66 inches width; main reef leader, 4,487,291 tons, 7.0 dwts. value, 50 inches width; main reef and leader (composite), 1,182,890 tons, 6.6 dwts. value, 71 inches width. Total, 6,013,300 tons, 6.8 dwts. value, 54 inches width. In addition to the above tonnage, there are blocks of ore developed amounting to 561,955 tons, but which, owing to insufficient data, do not at present permit of valuation. There are also accumulated in the mine 8,166,327 tons of ore of a value less than the present pay limit of 4.3 dwts. It should be borne in mind, however, that some of the ore at present classed as unpayable may in the future, under more favourable conditions, permit of profitable working as, included in this total, there is a considerable tonnage having a value of only slightly less than the present pay limit. Any appreciable reduction in working costs would, therefore, warrant the inclusion of this latter tonnage in the pay reserve. Expenditure on authorised votes.—Reference to last year's report will show that the amount of money estimated to be spent on plant and equipment, shaft sinking, etc., was £297,500. Of this amount £295,559 was duly authorised. Owing to delay in delivery of machinery and for various other reasons it was not found possible to complete all the work for which votes had been passed, and the actual expenditure incurred during the year was £215,685, leaving a balance unspent of £79,874. On completed votes a saving of £5,616 was effected over the amounts authorised, and an amount of £1,136 was expended in anticipation of 1913 requirements, thus leaving an unexpended balance of £73,122 to be carried forward to 1913. This amount is required for the completion of work in hand and for the payment of machinery and plant on order, but not yet delivered. Requirements for 1913.—In addition to the amount brought forward from 1912, it is estimated that a sum of £146,000 will be required for the current year's programme. Satisfactory development values have been fairly general throughout the property, the principal exceptions being in the Comet Mine, where in the lower levels on the eastern side poor values have been encountered. There has, however, been compensation in the high values disclosed in the 23rd and 24th levels of the Angelo, and in the indications of a general improvement in the Cason and eastern portion of the property above and in the neighbourhood of the Cinderella Consolidated Mines, Limited. As regards the Angelo Deep, the position remains much the same as at end of 1911. It is unfortunate that it has not been possible to do more work in this section, as the development disclosures here so materially affect future results, but it is expected that towards the end of the year entry will be made into the western area, south of the Wit Deep dyke, where indications point to ore of a generally higher grade than in other portions of the mine. Throughout the year much time and attention has been given to a thorough reorganisation of the various departments, and considerable improvements have been effected in the several plants—the result should be a gradual reduction in working costs during the coming year.

Gold Mine for Sale.

The Ariston Mine is for sale in the Klerksdorp district by private treaty as a going concern. The property consists of one block of 53 claims; one block of 49 claims; mine with all tramway, trucks, pumps and tools; reduction plant, comprising crusher, 10-stamp battery, tube mill, ball mill, two sand settler tanks, four sand treatment tanks, etc. The plant is complete in every respect, is still in full swing, and earning good profits. The property, which is about 1,000 yards from Ariston siding, on the Fourteen Streams line, can be taken over at once as a going concern, with its full complement of mine boys, and as everything has been arranged for economical and cheap working, this affords an excellent opportunity for two or three practical working men of obtaining and working a payable proposition right away. The mine must be sold, so this chance of picking up a bargain should not be missed. Tenders, addressed to Mr. H. Bramley, auctioneer and Government sworn appraiser, Box 56, Klerksdorp, will be received up till March 31st. Terms of payment, cash.

New Rand. Mr. A. R. Sawyer, the consulting engineer of the New Rand, Ltd., reports that No. 17 borehole has been completed at a depth of 2,524 feet. Arrangements are being made to put down another borehole.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Vacuum Filters: Who Pays the Piper?

To the Editor, *South African Mining Journal.*

Sir,—There is sometimes fun in advertising, and the advertisements and notes appearing in your journal recently are amusing. The winning firm (No. 1) of a big law suit notifies the public of the far-reaching effects of the decision given in their favour, and they are now on the Rand royalty hunting, we can see. They invite the users of vacuum filters in South Africa to do business with them, which in a nutshell is to pay more royalties and look sweet. The losing firm (No. 2) advertises that three judges in the Supreme Court of the United States have committed a grave error of judgment, but in any case the judgment given against them is a very limited one. They are strong in their convictions, however, for they wish to see the two judgments published side by side, namely, the judgment in their favour and the one against them. The legal advisers of No. 2 firm then ask them to contest in court No. 1 firm's right to use hydrochloric acid to cleanse the filter leaves. No. 1 firm advertise this in the American mining papers as "Hydrochloric acid wash nonsense." A new firm, No. 3, has now appeared on the scene, and they state that all vacuum filter patents on the Rand are dominated over by certain patents which they evidently control. The recent decision of the Supreme Court of the United States does not act as a precedent so far as vacuum filters in South Africa are concerned, but I am afraid that vacuum filtration on the Rand is at a standstill as far as new orders are concerned until the holders of the master patents of South Africa has been decided in the local Court. In a notice or in an advertisement appearing in your journal the local agents of the Butters' Patent Vacuum Filter Company stated that they agreed to "protect" users of the Butters' filters in South Africa against suits at law. If a similar decision is granted in the local Court to that given in the United States Courts, the local agents of the Butters' Company have a big job on. Who pays the damages?—Yours, etc.,

"FILTER."

The White Labour Supply.

To the Editor, *South African Mining Journal.*

Sir,—Present indications justify the conclusion that the next six months will be the most crucial period in the history of the Rand as regards the white labour supply. In a short time the annual exodus from the Reef, coinciding with the commencement of the English summer, will begin, and hundreds of the most capable and efficient miners on the Rand will be leaving us, the majority to return no more. A great number of these will be going back to their homes in Cornwall, that narrow windblown stronghold of the ancient Britons, which has been first and foremost in exploiting mineral wealth all over the world. Cornishmen are not paragons in every respect, but as miners they are not excelled. They are miners almost by heredity; the descendants of generations of miners; reared in an industrial environment comprised of miners and mining in diverse and various forms, their predilections and training all conduce to make them proficient in their vocation. It is an incontestable fact that the Cornishman has in the past been pre-eminent in the practical development of the mineral resources of the Transvaal. His early training has rendered him peculiarly adapted to the Rand on account of the close analogy in many respects between the systems and conditions here and at Home. Furthermore, his temperament and disposition make him a highly desirable citizen. The great deterrent factor operating to prevent the arrival of Cornishmen in such numbers as formerly is the dread of phthisis, that fearful scourge, the unenvied monopoly of the Rand which has exacted such terrible toll of the flower of Cornish manhood during the past twenty years. What effect the preventive measures which are now in operation will have remains yet to be seen. There can be no doubt that an amelioration of the evil has been effected, but the concensus of opinion among practical men is that amelioration is all we can hope for, and that a complete solution of the dust-preventing problem is as far off as ever. Another factor is the decline in wages, all the more potent as being coincident with extortionate rents, poor housing accommodation, and higher cost of living. To these may be added the insecurity of tenure and the diminishing chances of promotion for the purely practical man. Better conditions in the Delectable Duchy and the tears and entreaties of the womenfolk at Home are also factors whose influence is by no means negligible. The place of the Cornishman cannot be adequately filled by the cheap (?) unskilled labour from Southern Europe, and the mine-owners, so long indifferent to the trend of events, will soon be casting about for remedial measures for the retention of the capable miners, formerly the backbone of this great mining community, familiarity with whom has perhaps bred something approaching contempt in the official mind, but whose loss will surely have a derogatory effect on the future of the colossal industrial edifice in the building up of which they have played such a strenuous and prominent part.—Yours, etc.,

M. ROACH.

Box 149, Randfontein,
March 7th.

Rand Metallurgy and Honour Where Honour is due.

To the Editor, *South African Mining Journal.*

Sir,—Mr. Alfred James, the well-known metallurgical engineer, of London, is a busy man. Sometimes he is for a while in the United States, then he is in Mexico, occasionally he crops up at a meeting of the Institution of Mining and Metallurgy in London, and occasionally he pays a flying visit to the Rand. When on the Rand Mr. James calls upon a few friends, and perhaps also meets a few enemies. He has a look over some of the mines and is initiated into the mysteries or rather the good points of our metallurgical plants. He takes some notes on paper and these eventually become part of his well-known yearly article on the cyaniding of gold and silver ores, which appears in the *Mining and Scientific Press.* Considering the pace Mr. James keeps, he is a wonderful critic, and though several technical mistakes occur in his version of Rand metallurgy, these are permissible, as he is confronted with so many different views and opinions. Even Mr. James is not without his partiality. For some reason or other Mr. James is always up against the Consolidated Gold Fields mines. In his article for 1911 he discusses the Caldecott sand filter as a machine wasteful of vacuum and filter cloths. As regards the latter, he never went to the proper quarter to ascertain what the wear of filter cloths was. No one can deny that the introduction of Mr. Bosqui from America put new energy into Rand metallurgy. At the same time Mr. Bosqui is a new-comer to the Rand, whereas Dr. W. A. Caldecott is one of the pioneers of the cyanide process on the Rand. No one has done more than Dr. Caldecott for the development of the decantation process, which, by the way, still holds its own against the new metallurgy. Mr. Bosqui is an open-minded man, and has put a lot of Rand theories in the waste-paper basket, and has preferred to rely on actual tests rather than be led away by purely theoretical heresay. To Mr. Bosqui and his group, Rand Mines, Ltd., we give the credit for introducing on the Rand the Butters' filter, zinc dust precipitation, Dorr thickeners, Nissen stamps, Hardinge conical mill, etc. The lead in Butters' filters at the Crown Mines has been followed by other groups adopting vacuum filtration, such as the Randfontein group, "Johnnies," and Goerz & Co. Had other engineers foreseen the possibilities of the Nissen stamp a few years ago, the new mills of the Rand would have been operating at a less cost than they can to-day. Dr. Caldecott, though not the first to use the tube mill on the Rand, was the first to demonstrate the possibilities of the tube mill on the Robinson Deep. It was after the results there were published that tube mills were on order for the Rand by the dozen. Dr. Caldecott led the way in heavy stamps, and every mill built on the Rand since the Luipaardsvlei Estate adopted this principle and went one better by adopting heavier stamps than those named. Dr. Caldecott was the first to depart from the spitzlutte concentrator and to divide the pulp to a single cone for each tube mill. This principle has been freely adopted. Dr. Caldecott is the inventor of the diaphragm cone, which has also been freely adopted both in connection with sand filtering for stope filling, classification for tube milling and separating sand from slime. Dr. Caldecott is also the inventor of the sand filter table, which Mr. James does not fancy. This table has, however, been adopted by the East Rand Proprietary Mines, Kleinfontein group, and Goerz group. There are several other improvements in the cyanide process, both chemical and metallurgical, which are due to Dr. Caldecott. Mr. James, like Mr. Bosqui, is a great advocate of Butters' filters and zinc dust precipitation. None of these have been adopted by the Consolidated Gold Fields. Opinion still differs on the merits of these, and, as they are still young to the Rand, it is believed that the costs of filtration will fall to twopence per ton, and that difficulties met with in zinc dust precipitation will be overcome. Not until then can these innovations be considered an improvement and applicable to every reduction plant on the Rand. It is stated in metallurgical circles that the difficulties met with in zinc dust precipitation have been overcome by Mr. Dowsett, reduction officer of the Brakpan Mines. Sufficient has been said to show that Mr. James's criticism of the Gold Fields metallurgist has been unwarranted and distinctly unfair to an old pioneer of Rand metallurgy. Mr. James always has a good word to say for the metallurgist of the East Rand Proprietary Mines, Mr. E. H. Johnson. In 1911, according to Mr. James, Mr. Johnson was gaining the laurels of the Rand for some experimental work he performed with a tube mill and 10 stamps. For 1912 Mr. James tells us that Mr. Johnson shows some of the highest extractions on the Rand. The East Rand Proprietary Mines must therefore have made a big improvement in their gold recovery compared with the unfortunate results of 1911, when only a 92 per cent. extraction was obtained and metallurgical costs were over 4s. per ton. Mr. James was explicit in the good work of the Roodepoort United mill, and in his reference to the East Rand Proprietary Mines he might have told us what the reduction costs were to get "some of the highest extractions on the Rand." Mr. James practically pays a tribute to the metallurgical plants of the East Rand Proprietary Mines, Princess Estate and Geduld. He has evidently overlooked, however, that the principles embodied in these designs are in some respects Consolidated Gold Fields principles.—Yours, etc.,

"RAND METALLURGIST."

10th March, 1913.

ANSWERS TO CORRESPONDENTS.

X. Y. Z.—Your facts and figures are correct. The annual and quarterly reports prepared one for a falling away in recovery on account of the values disclosed by development. The mine is capable of milling substantially more rock than is at present being crushed.

E. Jones, Simmer Deep.—Ore reserves at the end of 1911 were 140,344 tons, average value 22·65 dwts. per ton. The old plant was dismantled in April, 1911. Outputs, etc., since end of 1910 have been:—

	Tons Milled.	Recovery.	Profit.
Year 1911	22,385	£91,454	£60,131
March quarter, 1912 ...	7,190	34,854	—
June quarter	8,893	38,021	21,447
September quarter ...	11,360	46,154	29,156

MINING MEN AND MATTERS.

We understand that Mr. C. B. Brodigan, formerly manager of the Brakpan Mines, proposes returning to the Rand at an early date.

* * * *

Mr. W. H. Dawe has left for England on a well-earned six months' holiday. During his absence Mr. A. G. Gill will act as chairman of the Neumann companies.

* * * *

His many friends along the Reef will unite in congratulating Mr. D. Drury, of the well-known engineering firm of Messrs. D. Drury & Co., on the occasion of his marriage, which takes place on Monday. Mr. Drury asks us to state that the wedding will be of a quiet nature, and no invitations are being issued.

* * * *

The annual dinner of the South African Institution of Engineers was held in the Carlton Hotel last Saturday night. Mr. J. A. Yule, President, presided over a large gathering, which included the officers of H.M.S. New Zealand and the visiting engineers from Kimberley. The function was quite one of the most successful in the history of the institution.

* * * *

The next monthly meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 17th March, 1913, at 8.15 p.m., when the following papers will be open for discussion: "The Occurrence of Sideroplesite and Ankerite in the Cassiterite Lodes at Rooiberg," by David P. McDonald, M.A., B.Sc.; "Note on the Origin of the Iridosmine in the Banket," by R .B. Young, M.A., D.Sc. (Edin.); "Note on a Composite Dyke from the Klipriversberg," by David P. McDonald, M.A., B.Sc.; "Notes on the Vertical and Bedded Veins of Pilgrims Rest," by A. von Dessauer, M.E. (Fri.i/S.); "Negative Spheroidal Weathering and Jointing in a Granite of Southern Rhodesia," by P. A. Wagner, D.Eng., B.Sc., M.E.; "Structural Features of the Western Witwatersrand," by E. T. Mellor, D.Sc. (Lond.). The following papers will be read: "Notes on the Sea Point Granite-Slate Contact," by E. H. L. Schwarz, A.R.C.S.; "Note on Diamonds in the Banket," by R. B. Young, M.A., D.Sc. (Edin.).

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings; Box 2061.

Rhodesian Section.

LATEST MINING NEWS.

Globe and Phoenix Developments—Opening Up Kambove—The Shamva—Bushman Copper—Susanna Developments—The Heroine Plant—Giant Profits—The Montezuma—Katanga Diamonds.

The following are the official details of the development work on the Globe and Phoenix Mine for January:—12th level (station reef), No. 1 winze south, has advanced 29 feet; average width of reef, 11 inches; average value over 30 inches, 2 dwts. 12th level (station reef), No. 1 raise south, has advanced 61 feet; average width of reef, 11 inches; average value over 30 inches, 5 dwts. 12th level north, north drive from main shaft, prospecting has advanced 120 feet; no reef. 13th level, drive south on east portion (footwall drive) has advanced 68 feet; average width of reef, 8 inches; average value over 30 inches, 30 dwts. 18th level, east portion, No. 3a winze north, has advanced 3 feet; no reef. 18th level, east portion, No. 2a intermediate winze south, has advanced 25 feet; average width of reef, 21 inches; average value over 30 inches, 133 dwts. 19th level, west portion, No. 2 winze north, has advanced 10 feet; average width of reef 33in.; average value, 26 dwts. 19th level, west portion, No. 1 winze north, has advanced 41 feet; average width of reef, 8 inches; average value over 30 inches, 16 dwts. 19th level, west portion, No. 2 raise north, has advanced 41 feet; average width of reef, 16 inches; average value over 30 inches, 36 dwts. 19th level, east portion north, prospecting on line of combined reefs, has advanced 110 feet; no reef. Crosscutting for month, 42 feet. Vertical shaft has advanced 97 feet; total, 574 feet.

* * * *

Five whites and some 200 natives are at work developing the Kambove Copper Mine. They will first build the railways inside the mine, which are necessary to its working, after which they will connect it with the Cape to Cairo railway by means of a branch line two kilometres long.

* * * *

Early last month the board of the Shamva Mines, Ltd., were informed that the reef in the crosscut on the 9th level had been exposed for 20 feet, giving an average value of 14·5 dwts. They have since been informed that a further 10 feet has been exposed, making 30 feet in all, the average now being 11 dwts. The reef still continues in both faces.

* * * *

In mail week the Bechuanaland Copper Company received the following advice of recent operations at their Bushman Mine:—Footage sunk, driven and raised for December, 211 feet; total, 9,585 feet. Third level—Rich lead intersected in crosscut No. 9; driven 11 feet and continues good. Crosscut No. 19 leached quartz gives 11 per cent. copper over 5 feet. First level—Rises Nos. 1 and 3 show good chute of ore.

* * * *

The following are official details of recent developments on the property of the Susanna Mines:—No. 10 level, Spur Reef winze has now attained a depth of 59 feet. At 45 feet a sample over 24 inches yielded 57·2 dwts., and at 50 feet a sample assayed 18 dwts. over 20 inches. No. 11 level—South drive to shaft—overhand stoping on the South Reef, above the 9th level; the reef at a distance of 30 feet from the floor is 15 inches wide and assays 15·7 dwts.

* * * *

The Heroine Company has ordered a Fraser & Chalmers 10-stamp 1,250lb. mill for its property at Umsweswe, and hopes to have the plant erected and running early in May. The present mill of two stamps is also being erected alongside the new 10-stamp mill, and it is hoped to crush from 2,000 to 3,000 tons per month with the 12 stamps. Active development work is being carried on on the property, and it is hoped, by the time the combined mill starts crushing, to have at least two years ore in sight. The prospects of the property are reported to be very good.

* * * *

The official statement of the profit on the working of the Giant Mine for January shows a surplus of £5,882, which is equivalent to a profit of 10s. 8d. per ton milled. The previous month's profit worked out at 13s. 7d. per ton, or an aggregate of £6,825; and in October the respective figures were 18s. 6d. and £10,000. The tonnage treated in January, viz., 11,000, was somewhat greater than in either of the other months quoted. The board has now issued the following statement:—"The falling off in grade is due to country rock from the subsidence recently reported being mixed up with the ore. It is expected that the output will improve after the end of March next. Arrangements have now been made to continue the sinking of the main shaft a further 200 feet. At this depth drives and crosscuts will be put in to explore the section of country intersected by the boreholes."

* * * *

The following summary of a development report regarding the Montezuma property is published by the London and Rhodesian Mining and Land Company:—210 feet level: Main east drive advanced 6 feet; total, 35 feet; average value, 19·6 dwts. over 42 inches; reef in face of excellent appearance; last assay, 22·5 dwts. over 40 inches. Main west drive advanced 7 feet; total, 20 feet; assays average value, 4·2 dwts. over 46 inches; reef in face of good appearance; last assay 4·6 dwts. over 50 inches. 117 feet level: Main east drive extended 8 feet; total, 215 feet; main west drive advanced 6 feet; total, 255 feet; assays average 9·5 dwts. over 40 inches; reef in face of good appearance, well mineralised; last assay, 17·4 dwts. over 48 inches. Rise, to connect "C" shaft, total 5 feet reef in top looking well. Crosscut: 120 feet east exposes strong body of quartz 9 feet wide; assay value, 8·2 dwts.; total width of reef at this point, 14 feet. "C" shaft sunk 10 feet; total, 55 feet; last assay, 5·2 dwts. over 36 inches.

* * * *

A Belgian report regarding the diamond pipes discovered by Tanganyika prospectors on the Kundelungu Tableland, in Katanga, states that up to the present 120 diamonds have been discovered in the pipes, but all are small ones; the 29 latest ones discovered weigh together only five carats. "It must, however, be pointed out that one rather big diamond was among them." At the present time four white people and some 60 or 70 natives are at work there. Eight of the pipes—Talana, Louanza, Kogwama, Katipa, Msipashi, Kambeli East, Kambeli West, and Shipuka—are being worked by the Kundelungu Committee (the Tanganyika and the Katanga Special Committee), and four others—Katoloi, Shilunga, Katwe, and Mafua, all by the Luizi River—are worked by the Katanga Special Committee. The working of the pipes is to be carried out on a larger scale. Machines have been ordered in South Africa which will be erected at Msipashi. The latter place will be connected by a motor car with the already existent motor car route linking Elisabethville and Kasenga, on the Luapula River. Lieutenant Tinant, of the Belgian Army, whom the Katanga Special Committee sent to Kimberley to study the working of the diamond mines, will shortly return to the Kundelungu, where before long 10 whites and about 200 natives will be employed.

THE FEBRUARY OUTPUT IN DETAIL.

Satisfactory Return for the Short Month.

Total output	734,122 ozs.
Value	£3,118,352
Decrease	55,268 ozs.
Value	£234,764
Rand output	702,394 ozs.
Value	£2,983,581
Decrease	58,587 ozs.
Value	£248,859
Outside districts	31,728 ozs.
Value	£134,771
Increase	3,319 ozs.
Value	£14,095
Total stamps	9,928
Decrease	81
Rand	9,375
Decrease	165
Outside districts	553
Increase	84

The gold production for the Transvaal for February was declared by the Chamber of Mines last week to be 734,122 ounces of fine gold, of the value of £3,118,352, which is a decrease compared with the January return of 55,268 ounces, value £234,764. The decline appears to be a large one, but is not so in reality, because of the difference in the number of working days—three—in the two months. The return itself is therefore highly satisfactory, and judged by the average daily return and profit declared as disclosed by the group figures, is the best which has yet been made. The Witwatersrand production for February of 702,394 ounces, value £2,983,581, shows a decrease of 58,587 ounces, value £248,859, but based on the average daily yield for January, it ought on the number of working days contained in each month to be some £313,000 less. The month's yield is, therefore, excellent. Outside districts show an unexpected increase of 3,319 ounces, value £14,095. The native labour returns, according to the Native Labour Association figures, show an increase of nearly eight thousand. The average daily yield for the Rand for February of £106,556 marks a substantial record of £2,284 above the previous best, which was in January, the daily average for that month being £1,237 above the record average reached in November. The average daily profit too is the highest yet recorded. The average for February of £35,814 is £80 per diem above the declared profits for December, and now constitutes the record.

Labour.

There is an increase for February of 7,666, according to the Witwatersrand Native Labour Association figures, compared with January, on the total employed on gold, coal and diamond mines. There is an increase on gold mines of 7,572, and an increase on coal mines of 88, while diamond mines increased their complement by 6. The figures for the past three months of the numbers employed by members of the W.N.L.A. at the last day of each month read:—

	December.	January.	February.
Gold mines	191,316	200,000	207,662
Coal mines	8,634	8,789	8,877
Diamond mines ..	14,965	13,192	13,918
Totals	214,915	222,791	230,457

The Stamp Position.

The stamp position for the whole of the Transvaal shows a decrease of 81 compared with January. The Rand returns a decrease of 165, of which the closing down of the Lancaster West is responsible for 100, and outside districts an increase of 84, leaving the balance as above. There were 276 tube mills operating on the Rand and 9 in outside districts. The details of the changes are:—Rand: Decreases—Ferreira Deep, 5; Knight Central, 15; Lancaster West, 100; New Kleinfontein, 10; Wit. Deep, 15; miscellaneous, 40. Increases—Brakpan Mines, 10; Jupiter, 5; Simmer Deep, 5. Outside districts—Increases—Sheba, 5; Rosetta, 20; miscellaneous, 59. Net decrease, 81.

The First Dozen Companies.

The following are the details of production of the twelve leading companies:

	Stamps.	Tube Mills.	Tons Crushed.	Value.
Crown Mines	660	25	170,000	£268,393
Randfontein Central	800	29	209,286	248,734
East Rand Proprietary ...	820	25	150,100	241,726
Ferreira Deep	250	6	50,230	104,078
Robinson	250	6	52,100	102,519
New Modderfontein	180	7	48,400	99,308
Rose Deep	300	7	63,510	90,150
Brakpan Mines	160	8	56,010	85,439
Nourse Mines	260	7	49,700	79,785
City Deep	150	9	41,900	79,581
Geldenhuis Deep	300	7	52,000	77,925
Knights Deep	400	9	100,300	74,552
Totals	4530	145	1,043,536	£1,552,190

Group Profits.

The following are the profits returned for November, December and January by the mines controlled by the different groups:

	December.	January.	February.
Rand Mines (Eckstein) ...	£256,107	£230,347	£233,575
Rand Mines (Subsidiaries)	256,589	276,281	241,809
Gold Fields group	115,221	107,419	98,347
Robinson group	106,225	102,156	84,609
East Rand Proprietary ...	94,654	95,693	89,514
Barnato group	77,391	79,198	74,114
General Mining group ...	70,551	66,262	63,107
Neumann group	54,281	53,085	46,112
Cons. Mines Selection ...	41,222	39,115	37,407
Kleinfontein group	24,642	23,496	23,891
Goerz group	10,859	15,417	10,317
Totals	£1,107,753	£1,088,469	£1,002,802

Increases and Decreases.

The following returns of the February output have been filed with the Chamber of Mines. Increases and decreases compared with January are subjoined:—

The Witwatersrand.

	Jan.	Feb.	Inc.	Dec.
	£	£	£	£
Aurora West	19,472	18,325	—	1,147
Bantjes Consolidated	38,599	38,145	—	454
Brakpan Mines	91,122	85,439	—	5,683
Cinderella Consolidated ...	25,291	22,874	—	2,417
City Deep	79,989	79,581	—	408
City and Suburban	52,791	48,088	—	4,703
Consolidated Langlaagte ...	58,338	55,263	—	3,075
Crown Mines	298,879	268,393	—	30,486
Consolidated Main Reef ...	34,513	31,964	—	2,549
Durban Roodepoort Deep ...	38,361	36,390	—	1,971
Durban Roodepoort	15,101	14,353	—	748
East Rand Proprietary ...	264,066	241,726	—	21,340
Ferreira Deep	113,852	104,078	—	9,774
Geldenhuis Deep	82,644	77,925	—	4,719
Glencairn	18,371	15,037	—	3,334
Geduld Proprietary	19,709	17,849	—	1,860
Ginsberg	21,978	20,457	—	1,521
Jumpers-cum-Treasury ...	14,519	12,968	—	1,551
Jupiter	39,869	36,832	—	3,037
Knight Central	31,616	26,540	—	5,076
Knights Deep	82,070	74,552	—	7,518
Langlaagte Estate	61,983	55,216	—	6,767

	Jan.	Feb.	Inc.	Dec.
	£	£	£	£
Luipaardsvlei Estate	17,883	17,403	—	480
May Consolidated	15,211	14,769	—	442
Main Reef West	28,494	28,252	—	242
Meyer and Charlton	32,270	34,096	1,826	—
Modder B.	61,184	60,484	—	700
New Goch	28,150	27,270	—	880
New Heriot	20,381	19,684	—	697
New Kleinfontein	70,924	67,755	—	3,169
New Primrose	36,165	34,402	—	1,763
New Modderfontein	99,235	99,308	73	—
New Rietfontein	18,966	17,254	—	1,712
Nourse Mines	81,564	79,785	—	1,779
New Unified	16,838	15,525	—	1,313
Princess Estate	29,105	27,219	—	1,886
Robinson Deep	71,808	69,153	—	2,655
Robinson	101,669	102,519	850	—
Randfontein Central	273,741	248,734	—	25,007
Rose Deep	98,254	90,150	—	8,104
Roodepoort United	30,452	20,134	—	10,318
Simmer Deep	53,267	51,279	—	1,988
Simmer and Jack	80,996	73,358	—	7,638
Spes Bona Tribute	6,716	6,180	—	536
Van Ryn	55,875	51,967	—	3,908
West Rand Consolidated ...	43,900	41,696	—	2,204
Village Deep	76,935	69,705	—	7,230
Village Main Reef	76,748	66,766	—	9,982
Vogelstruis Estate	16,107	15,640	—	467
West Rand Central	3,466	3,475	9	—
Witwatersrand	49,316	48,127	—	1,189
Wit. Deep	54,001	50,030	—	3,971
Wolhuter	36,836	33,825	—	3,011
Miscellaneous producers ...	19,713	15,642	—	4,071
Outside Districts.				
Barrett	650	777	127	—
Glynn's Lydenburg	8,194	6,079	—	2,115
Nigel	20,143	18,694	—	1,449
Sheba	13,877	12,586	—	1,291
Sheba-Rosetta	—	930	930	—
Sub Nigel	8,385	8,236	—	149
Transvaal G.M. Estates ...	42,656	41,101	—	1,555
Worcester	4,303	4,536	233	—
Miscellaneous producers ...	22,468	41,832	19,364	—

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Witwatersrand.				
Aurora West	13,083	80	4,314	£18,325
Bantjes Consolidated	25,300	100	8,980	38,145
Brakpan Mines	56,010	160	20,114	85,429
City Deep	41,900	150	18,735	79,581
City and Suburban	25,300	150	11,321	48,088
Cinderella Consolidated ...	17,440	80	5,385	22.874
Consolidated Langlaagte ...	38,900	100	13,010	55,263
Consolidated Main Reef ...	21,633	100	7,525	31,964
Crown Mines	170,000	660	63,185	268,393
Durban Roodepoort	12,864	90	3,379	14,353
Durban Roodepoort Deep ...	23,860	100	8,567	36,390
East Rand Proprietary ...	150,100	820	56,907	241,726
Ferreira Deep	50,200	250	24,502	104,078
Geldenhuis Deep	52,000	300	18,345	77,925
Ginsberg	13,490	80	4,816	20,457
Glencairn Main Reef	18,950	160	3,540	15,037
Geduld Proprietary	14,020	50	4,202	17,849
Jupiter	40,800	105	8,671	36,832*
Jumpers-cum-Treasury ...	5,430	60	3,053	12,968*
Knights Deep	100,300	400	17,551	74,552
Knight Central	22,900	100	6,248	26,540
Langlaagte Estate	49,818	200	12,999	55,216
Luipaardsvlei Estate	15,510	60	4,097	17,403
Main Reef West	18,105	90	6,651	28,252
May Consolidated	13,830	100	3,477	14,769
Meyer and Charlton	13,041	75	8,027	34,096*
Modderfontein B.	31,450	80	14,239	60,484
New Goch	24,900	120	6,420	27,270
New Heriot	10,600	70	4,634	19,684
New Kleinfontein	46,900	200	15,951	67,755
New Modderfontein	48,400	180	23,379	99,308
New Primrose	23,300	160	8,099	34,402
New Rietfontein	14,500	120	4,062	17,254
New Unified	11,400	60	3,655	15,525
Nourse Mines	49,700	260	18,783	78,785
Princess Estate	21,100	60	6,408	27,219
Robinson	52,100	250	24,135	102,519
Robinson Deep	53,200	160	16,280	69,153*
Randfontein Central	209,286	800	58,557	248,734
Roodepoort United	24,713	50	4,740	20,134
Rose Deep	63,510	300	31,223	90,150
Simmer Deep	60,150	160	12,072	51,279*
Simmer and Jack	71,400	320	17,270	73,358*
Spes Bona Tribute	5,727	40	1,455	6,180
Van Ryn	36,300	135	12,234	51,967*
Village Deep	41,800	180	16,410	69,705
Village Main Reef	37,400	220	15,718	66,766
Vogelstruis Estate	12,076	75	3,682	15,640
West Rand Central	1,761	20	818	3,475
West Rand Consolidated ...	27,000	100	9,816	41,696
Witwatersrand	37,010	220	11,330	48,127
Witwatersrand Deep	34,840	230	11,778	50,030
Wolhuter	24,800	120	7,963	33,825
Miscellaneous producers ...	—	—	3,682	15,642
Outside Districts.				
HEIDELBERG—				
Nigel	11,000	75	4,401	18,694
Sub Nigel	4,245	20	1,939	8,236
BARBERTON—				
Barrett	—	—	183	777
Sheba-Rosetta	392	20	219	930*
Sheba	5,500	65	2,963	12,586
Worcester Exploration ...	5,650	40	1,068	4,536
LYDENBURG—				
Glynn's Lydenburg	2,964	20	1,431	6,079
Transvaal G.M. Estates ...	13,763	75	9,676	41,101
Miscellaneous producers ...	—	238	9,848	41,832

*Meyer and Charlton includes 380 ozs., value £1,614, taken from production and added to reserve. *Van Ryn includes 33 ozs., value £140, taken from production and added to reserve. *Jumpers-cum-Treasury includes 75 ozs., value £318, taken from production and added to reserve. *Jupiter does not include 400 ozs., value £1,699, taken from reserve and declared in output. *Robinson Deep does not include 900 ozs., value £3,823, taken from reserve and declared in output. *Simmer Deep includes 250 ozs., value £1,062, taken from production and added to reserve. *Simmer and Jack does not include 250 ozs., value £1,062, taken from reserve and declared in output. *Sub Nigel does not include 100 ozs., value £425, taken from reserve and declared in output. *Sheba-Rosetta, two months returns.

Neumann Group.

The following are particulars of the results achieved by the crushing companies in this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep	34,840	£49,550	£16,215
Wolhuter	24.800	33.430	9,199
Consolidated Main Reef ...	21.633	31,626	10,486
Main Reef West	18,105	27,920	6,621
Knight Central	22,900	26,158	3,591
Totals	122,278	£168,684	£46,112

The monthly profits for 1913 are:—January, £53,085; February, £46,112.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for last month of the undermentioned companies of the Consolidated Gold Fields group:

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit
Simmer and Jack ...	320	7	71,400	17,520	£37,165
Robinson Deep	160	10	53,200	17,180	28,882
Knights Deep	400	9	100,300	17,551	20,001
Simmer Deep	160	9	60,150	11,822	6,748
Jupiter	105	6	40,800	9,071	3,566
Sub Nigel	20	1	4,245	2,039	1,985
Totals	1165	42	330,095	75,183	£98,317

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £2,500; Robinson Deep, £942; Knights Deep, £633; Simmer Deep, £394; Jupiter, £436; Sub Nigel, £353; total, £5,258.

Reserve Gold.—Simmer and Jack, 850 ozs.; Simmer Deep, 750 ozs.; Jupiter, 350 ozs.; Sub Nigel, 500 ozs.; total, 2,450 ozs.

Knights Deep.—Of the total profit, £2,668 must be deducted in terms of circular to shareholders, dated 26th September, 1912.

Barnato Group.

The following are the results of operations for last month on the producing mines of the Barnato group:—

COMPANY.	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte .	100	38,900	£55,261	£17,723
Ginsberg	80	13,490	20,455	6,698
Glencairn Main Reef ...	160	18,950	15,039	1,873
New Primrose	160	23,300	31,404	18,329
New Rietfontein	120	11,500	17,252	2,600
New Unified	60	11,400	15,524	4,546
Quest	30	3,133	2,709	233
Witwatersrand	220	37,010	48,128	22,112
February totals ...	930	160,683	£208,772	£74,114
January totals ...	930	176,394	£222,885	£79,198

The monthly profits for 1913 are: January, £79,198; February, £74,114.

Goerz Group.

The following are the results of operations of the crushing mines comprising the Goerz group for last month, viz.:—

	No. of Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	13,830	£14,733	£4,070
Princess Estate ...	60	5	21,100	27,153	1,997
Geduld	50	2	11,020	17,805	4,250
Totals ...	210	7	45,950	£59,691	£10,317

At the Geduld the decreased profits are owing to the small tonnage treated, which was due partly to the short month and partly to changes in the mill in connection with extension of the plant.

The monthly profits for 1913 are:—January, £15,417; February, £10,317.

Robinson Group.

The results of operations for February of the Robinson group of mines are as follows:—

	TONS.	OZS.	PROFIT.
Langlaagte Estate	49,818	12,999	£14,000
Randfontein Central	209,286	58,557	70,609
Totals	259,104	71,556	£84,609

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Engineering Notes and News.

The Cascade Motor.

In the course of a long and interesting reply to the discussion on his paper read before the South African Institution of Engineers on the Cascade motor, Mr. M. I. Williams-Ellis said, at the February meeting of the Society:—When in England, a few months ago, I saw in course of construction upwards of 80 one-speed "Cascade" motors, aggregating 5,000 horse power, for a Portland cement works in British Columbia. These works will probably be unique, for although a good few of the machines have a capacity of upwards of 200 B.H.P. there will not be a single slip-ring machine in the whole installation. It is much to be regretted that the variable speed underground winders for the Van Ryn Deep are not yet quite completed, as these will be the first two variable speed winders of their type ever installed on the Rand. In connection with the discussion on the writer's paper, I also wish to thank Messrs. Vaughan and Schmitt for their contribution. The reference made by Mr. Schmitt to the electric winder on the Robinson Deep Mines, installed some years ago, is most interesting. This particular winder was brought to my notice some three or four years ago, while I was writing a paper for the Association of Mining Electrical Engineers. The system adopted there, to obtain two rope speeds of 1,000 and 2,000 feet per minute, necessitated the adoption of a motor with two sets of poles, *i.e.*, 32 and 16, but as stated, the time taken in changing from one set of poles to the other was considerable, with the result that the winder lost speed. In the "Cascade" system, however, when changing from one speed to another, the main circuit is unbroken, so that there is no loss of time or speed during the operation. Mr. Vaughan has brought up a most interesting question of braking winders regeneratively and otherwise. Regenerative braking has not been adopted, so far, on these fields to the writer's knowledge in connection with induction motors, counter-current and eddy-current braking being the system adopted out here. The failures mentioned by Mr. Vaughan have been entirely in connection with counter current braking, which although effective in itself, tends to show up any weak points in connection with the control or switchgear work in conjunction with such winders. It would, in the writer's opinion, be most interesting to many members if a paper was read on the controllers and general switchgear work now adopted for use with electric winders, this paper being made the more interesting by having available the practical experience gained on these fields. Returning to the question of braking, brought up by Mr. Vaughan, much useful information has been given us by a paper recently read by Mr. Chambers on eddy-current braking out here, and in which many important questions have been raised in connection with braking generally. Complete installations of this system have been installed at the City and Village Deep Mines, which I understand are giving very satisfactory results. Mr. Heather refers to the possibility of utilizing the actual motor itself as the eddy-current brake, by supplying the windings with continuous current from either a small fly-wheel generator set, supplemented or not by a battery. It may be interesting here to mention that tests are now being carried out in this direction by Messrs. Sandycroft, Limited, in connection with the "Cascade" motor. The exact system that is being adopted cannot well, however, be brought forward in this paper, as patents have not yet been completed. Counter-current braking, in the author's opinion, is not as safe as eddy-current braking, although effective up to certain limits, for the reason that the resistance in the secondary circuit must be varied with the speed, in order to give constant torque, and should the speed exceed a critical value, the torque falls off and the machine runs away. With reference to Mr. Kirkland's comments on the paper, he brings forward some important points in connection with modern electrical practice, in connection with the vast possibilities of three-phase induction motors, designed for two or more speeds. He mentions numerous classes of work that the variable speed induction motor can be adapted to,

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and the little interest that has been taken in such a system until recently by engineers. The variable speed induction motor is to day being adapted for all classes of work, such as for instance in the case of winding, the lower speeds in this case being often used for the inspection of ropes and shafts. Also one speed may be used for winding rocks, and the bottom speed for winding men. The motors are also used for mine ventilation, such as may be found in colliery practice, where the speed of the fan is reduced during the week ends; again, in rolling mill practice, where the initial speed of the mill is required to be lower than in the final stages of rolling out the billet; also in connection with traction work, such as may be found in the Simplon Tunnel system, explained in the author's paper. The possibilities, therefore, of the variable or multi speed motor are increasing day by day.

ELECTRIC WINDING ENGINES.*

[By A. E. du Pasquier.

In this paper the author discussed not the relative advantages of steam and electricity, but the principles governing the type of winder for particular conditions, and the influence of drum profile on the results obtained. He pointed out that there was a general trend towards electric driving, and the makers of steam winders were with one accord making their designs more suitable for electric operation. The tendency was strengthened by the growth of the large power companies, which he regarded with favour as being to the advantage of the consumers rather than to install their own generating plant. A close estimate of the load factor was of the first importance; the smaller it was, the less chance had the local generating plant. Where coke-ovens were used, the use of local plant, however, was essential to economy, provided that the surplus energy could be disposed of by co-operation with a supply company, as in many cases on the North-East Coast. Comparing A.C. and D.C. winders, the author stated that in the case of the former, speed regulation was effected by inserting resistance in the rotor circuit, a wasteful method, while with D.C. the Ward-Leonard system was always used; the latter showed an economy of energy per wind, and the A.C. winder cost 20 per cent. less, and if the intervals between were prolonged, the saving was lost. Regenerative braking was practicable with the Ward-Leonard control, but this had little effect on the total consumption. The equalising effect on the load of a cylindro-conical drum was very marked. The introduction of improved double-helical gearing had benefited the A.C. motor, by enabling it to run at speeds at which high efficiencies and power factors were attainable. The accelerating and retardation periods should be so arranged that the accelerating torque turns will be as nearly as possible equal to the product of the statical moment by the number of revolutions made by the drum in the decelerating period. "Equalising" was to be avoided if possible. Valuable assistance could be obtained from a drum with a special profile, and from the use of a tail rope. Table I. gives a comparison of the results obtainable with an A.C. motor under various conditions, without equalising :—

TABLE I.

Drum.	Drum speed R.P.M.	Motor H.P.	Motor speed R.P.M.	Units per wind.	Accelerating peak.	Price ratio.
Cy-Con. 8′ 6″-13′ 0″ ..	50	480	290	4·8	720	1·1
Cy-Con. 8′ 6″-13′ 0″ ..	50	460	50	4·8	700	1·55
Cylindrical 12′ 0″ ..	50	750	290	5·6	1,730	1·1
*Cylindrical 12′ 0″ ..	45	480	290	4·75	900	1·0
Cylindrical 12′ 0″ ..	50	730	50	5·5	1,630	1·68
*Cylindrical 12′ 0″ ..	50	465	50	4·6	870	1·58

* Tail rope 10 lb. per ft.

Details of winder.—Depth of shaft, 1,080 ft.; load, 3 tons; number of decks per cage, 3; weight of each cage and chains, 80 cwt.; number of tubs per deck, 2; weight of each tub, 6 cwt.; circumference of rope, $5\frac{1}{4}$ in.; weight per yard, 14 lb.; winding time, 47 sec.; decking time, 30 sec.; output per hour, 140 tons. A hoist of this nature would be quite impossible operated from the ordinary colliery generating station, or small power company, and under such conditions of supply the colliery company would have to adopt an equalised system at a cost of about 50 per cent. more. With the uniform turning moment of the electric motor tailropes gave no trouble; they were in use in some of the Rand mines, with shafts 4,000 ft. deep. Nowadays, the author said, the maximum peak load affected feeder drop more than generator regulation, and it was often better to spend money on additional feeders than on equalisers, except where the colliery was at a considerable distance from the power station. On the Rand, with thousands of H.P. of electric winding plant in use, there were no equalisers. In any case, there was no need to attempt to get perfect equalisation—a peak of 15 per cent. above the mean demand was permissible. The fly-wheels should be run as fast as possible—peripheral speeds of 100-120 m. per sec. were now quite common—and provided with an excess speed safety cut-off. As the wheels had to be solid castings, not over 12 ft. 6 in. in diameter, on account of transport difficulties, the maximum speed of the motor-generator was thus approximately fixed. Bearing pressures up to 200 lb. per sq. in. of projected area were satisfactory, with forced lubrication from a tank, at 10 to 15 lbs. per sq. in., oil pumps returning the oil to the tank through a cooler. An oil-failure alarm should be provided. The equaliser should be designed for a maximum slip of $12\frac{1}{2}$ to 15 per cent., and should be capable of completing one wind in case of failure of the supply; the fly-wheel should be situated at one end of the set, with a coupling permitting it to be disconnected without shutting-down the plant. A brake for stopping the wheel quickly was necessary. The Westinghouse equaliser for A.C. winders was in parallel with the load, instead of in series with it, and this involved much smaller losses; the slip could be increased to 30 per cent., enabling a smaller wheel to do the same work, and the equaliser set could be completely shut down without interfering with the winding. In the event of growth of the power station to such an extent that equalising was no longer necessary, the whole of the losses inseparable from the use of such sets could thus be cut out. Table II. gave a comparison of the systems considered, the figures being for a complete winding cycle, including decking (see under Table I.) Comparing A.C. and D.C. winding, the author gave preference to the former for simplicity, first cost, maintenance and space occupied, and to the latter for regulation, control and braking, while, in respect of reliability, efficiency, power factor and equalising, there was, on the whole, no great difference between the systems. The author dealt at some length with the question of drum profile, and commended the practice of lapping the ropes on the drums (winding in two layers), which had been in use on the Rand, for some time. He stated that, as the depth of shaft increased, the load also should be increased; for a depth of 500 yds., the economical lower limit seemed to be three tons with a 50-second wind, raising about 200 tons per hour. Drums should be kept as light and small as possible. Drums of unnecessarily large diameter were often used; the ratio of drum diameter to rope diameter might be as low as 44 : 1, and of drum diameter to the diameter of the individual wires 1.000 : 1. Small diameter of drum reduced the statical moment and the first cost, increased the drum speed, and, with scroll drums, greatly assisted in equalising the winding diagram without unduly increasing the inertia. The author submitted that with modern conditions, using electric winding engines, a factor of safety of 10 for the ropes was no longer necessary; at the De Beers mines a factor of safety, omitting bending and acceleration stresses of 5.2 was employed, and allowing for these stresses, the actual factor of safety was 2.33. The use of the Thury high-pressure D.C. system in the case of three small winders was mentioned. The effect of suitably designing the profile of the drum on the winding diagram was fully dealt with in the paper, with the aid of numerous diagrams.

TABLE II.

—	Price ratio.	Units per wind.	Average power factor.	No load losses winding at night.	Weight of flywheel, tons.
A.C.	1·00	4·52	0·8	Nil	Nil
A.C. equalised ..	1·45	5·22	0·9	Nil	4 5
D.C. equalised ..	1·65	4·66	0·92	33 units per hour	7·5

—	R.P.M. of fly-wheel.	Average demand from line, E.H.P.	Max. demand from line, E.H.P.	Heating capacity of motor. H.P.
A.C.	—	520	1,040	550
A.C. equalised ..	800/560	600	750	550
D.C. equalised ..	800/680	525	620	540

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*Abstract of paper read before the South Wales Institute of Engineers, September, 1912.

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Automobile Notes.

The second report of the R.A.C. Petrol Committee has now been issued in forty-five pages of closely-printed foolscap, forming a valuable record of hard work performed in the interest of the motorist, which, even if it does not lead to an elucidation of the fuel problem, at any rate presents the problem in the clearest terms, and puts the whole position regarding the present price of petrol and the future possibilities of obtaining alternative fuels definitely before the motoring public. The petrol question is disposed of in the following bold statement: "After careful consideration of all the circumstances, the committee is of the view that no further useful action can be taken at the moment in regard to the supply or distribution of petrol that would tend to reduce the cost of spirit to consumers.' The chief reasons that have led the committee to this view are: (a) That the demand for petrol is almost greater than the apparent existing supply, and this demand is rapidly increasing in all countries; (b) the increasing cost of production of the spirit at the oilfields and the abnormal freight charges for the sea transport of the spirit now prevailing; (c) the extravagant compulsory methods of handling and distributing the spirit. The committee consider that the consumer can only hope for a reduction in the price of the spirit through the establishment of conditions, such as the following: (1) The opening up of new commercially productive oilfields, and an increase in the number of competitive owners of oilfields; (2) the building of competitive tank steamers; (3) the more general supply of petrol in bulk, such as in steel barrels of 40 gallons capacity and upwards, instead of in two-gallon tins; (4) the use of an alternative fuel or fuels.

* * * *

The last suggestion the committee appears to consider to be the one that could be most easily developed, and the most likely to prove of real benefit to the consumer. With regard to the scarcity of tank steamers, Mr. J. I. Jacobs, a tank steamer owner and shipbroker, in his evidence, stated that by far the greater part of the motor spirit imported into this country came in the oil companies own tank vessels, so that the question of actual freight charges should not arise at all. A large number of new tank ships are now in the course of construction, but it is doubtful if their completion will have any effect upon petrol prices.

* * * *

In regard to the production of alternative fuels, the joint committee are now prosecuting their inquiries, and the result of their investigations will be embodied in the final report of the Petrol Committee. In respect to benzol, however, they have done useful work in examining a number of expert witnesses engaged in the manufacture or production of that spirit. There is no technical difficulty about the use of benzol as fuel for the modern motor car. It can be used with complete success without any alteration whatever to engine and fittings. It is, however, in its production as a commercial proposition that the difficulty appears. Mr. N. N. Holden, of Messrs. Hardman & Holden, manufacturers of benzol and kindred products, stated that he had

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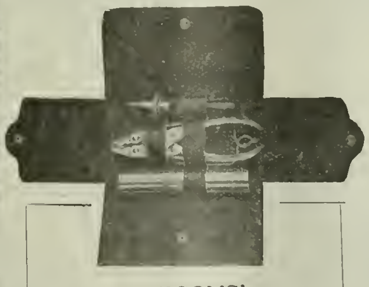

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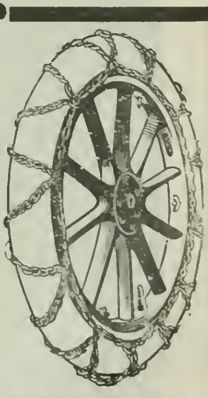

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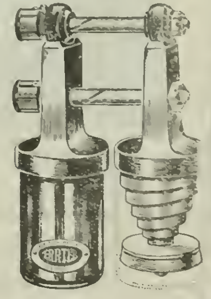

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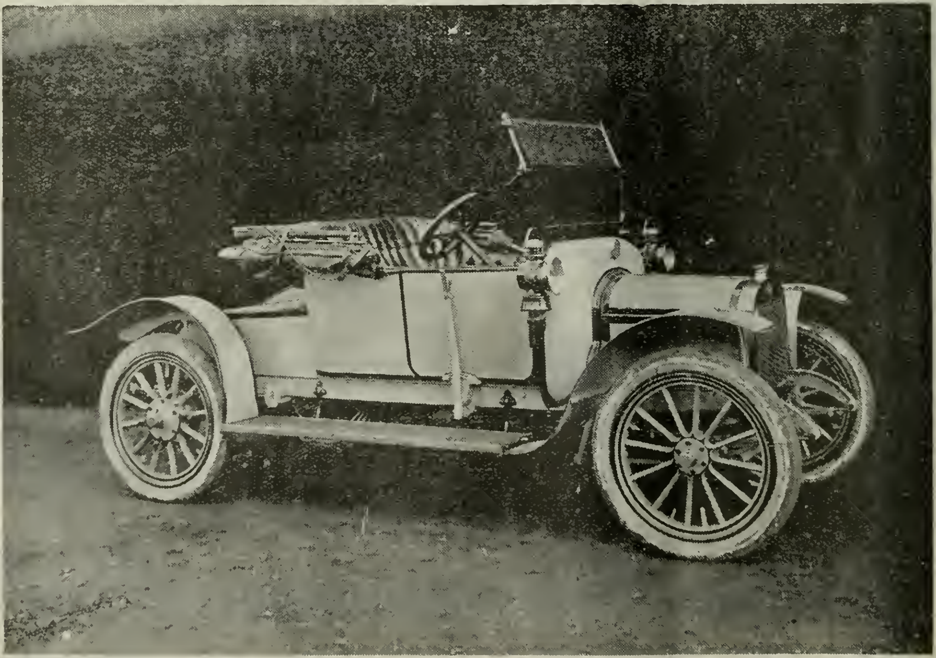

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used benzol satisfactorily for motor purposes for the last ten years. He estimated the total annual output in Great Britain as something under 11,000,000 gallons, but stated that new recovery plants were now in course of erection. He hoped great things from a new tar spirit, with which his firm was experimenting, and of which he promised to give the committee fuller details at a later date. Lieutenant-Colonel T. Wilton, of the Gas Light and Coke Company, did not consider that the amount of benzol at the disposal of the gas companies was likely to increase in the future. Mr. J. E. Mitchell, of the Mitchell Main Colliery, spoke as one who obtained benzol, not in the process of gas making, but by means of recovery plants in connection with coke ovens. His estimate of the total output of crude spirit from coke was about 23½ million gallons.

* * * *

The total amount of petrol required for annual consumption in Great Britain at the present time is close on 100 million gallons—more than four times the quantity of benzol produced, taking even the highest estimate. It is apparent, therefore, that much remains to be done before benzol can be regarded as a serious rival to petrol, and even when equality of production has been reached, equality, at least, in efficiency must be assured. When benzol is strong enough to challenge petrol in the open market, a rate-cutting war is inevitable, and unless the home product can be accorded some measure of protection through the Legislature, the issue will be all in favour of the foreign spirit.

* * * *

"Prime Movers" was the subject selected by Mr. S. Z. de Ferranti for the James Watt anniversary lecture at Greenock. He said that it seemed to be clear, as far as our present knowledge went, that for small powers the internal combustion engine was the best. It was probable that in time the whole of the coal used for firing large units would be gasified and the by-products recovered. When that result was brought about, they would have not only an ample cheap supply of fertiliser for the land, but also a large quantity of the tar oils, which would form a suitable means of firing for naval purposes, and relieve them from the necessity of purchasing fuel oil abroad, and the risk and cost which that process involved. They would also have an ample supply of benzol for small motor requirements. That, he thought, was the solution of the fuel problem for those motors, rather than in the production of alcohol on a large scale from the land, as had lately been advocated.

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Union Industries. The Government is again issuing forms to the various manufacturers and producers in the Union with a view to securing for departmental purposes as complete a return as is possible of the extent of the operations of the different manufacturing activities in the country. These returns have in the past not been as complete as has been desirable, though a welcome increase of co-operation on the part of manufacturers with the Union authorities was remarked last year.

* * * *

Orange Growing in the Transvaal. Mr. A. Jonnes, Brits, writes to the "Agricultural Journal": It is not generally known what a wonderful outlook the Transvaal and South Africa generally has in the future of the citrus business. There are certain localities which have been proved to be especially suited to orange culture, but as water is not available everywhere it follows that not all the lands suitable are able to be planted, for water is very necessary to the citrus during our dry winter. The best belt known in the Transvaal is situated along the northern slopes of the Magaliesberg Mountain range, where the decomposed ironstone, washed down for thousands of years, makes the finest soil for producing fruit of the best flavour. Hitherto all the oranges grown, with few exceptions, have been eaten locally, but now that the Horticultural Division of the Department of Agriculture have opened the eyes of the people to the fact that London alone consumes £12,000 worth of fresh fruit every day, and that we can get our oranges there in the hottest weather—May to August—when folks clamour for something juicy, it follows that we have a market not only to take all we can send, but ten times as much as we can possibly export for many years to come. The orchards of citrus suitable for export trade are few, as it is only quite recently growers began to understand that to ship they must grow varieties wanted in London. The Washington Navel has all over the world proved itself the best shipper and keeper and nurserymen are being put on their mettle to supply the demand for young trees. In addition to the population of London, we have all England and the Continent, so that we can figure on supplying 80,000,000 to 100,000,000 people in the near future. This, to the uninitiated, may sound "talk talk," but when you remember that only two countries south of the Equator grow oranges—Africa and Australia—which ripen in the season when all Spanish fruit is over, it will be seen that we have a market all our own so to speak, as Australia can never be a serious competitor of ours in the European market, for the reason that distance and freight bar the door to her for citrus.

* * * *

The Cooke Scheme. Rumours have recently been current that Captain St. John Cooke, of the Vaalbank Collieries, who has been in Lisbon for some months, had succeeded in interesting the Government in his project for the acquisition of the Lingham concession

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at Matolla, with a view to turning that place into a great coaling station, says the *Lourenco Marques Guardian*. It was said that Captain Cooke had actually purchased the concession on behalf of a London syndicate, and that the sum of £100,000 had been paid as the purchase price. It was further alleged that the Government in Lisbon had made itself a party to the project, and that the plans for the immediate erection of a purely Government-owned installation would go by the board. It is almost unnecessary to say that all this created a considerable amount of alarm here in the minds of those who recognise that it would be a very unwise thing, and a distinct violation of the essential administrative principle, for any Government to hand over the working of a portion of port equipment to a monopolistic private concern. Inquiries which we promptly set on foot resulted, however, in eliciting the fact that if Captain St. John Cooke had actually purchased the Lingham site the Government had nothing to do with the transaction one way or another, and that if he chooses now, without the Coalowners' Association being interested in the scheme, to spend £125,000 more in equipping Matolla and extending the pier there into deep water, that is his own look out.

New Registrations.

The following is a list of companies registered in February, 1913 :

4139. West Rand Chemicals, Limited, 12, Rissik Street, Johannesburg; capital, £3,000.
4140. Kumst Diamonds, Limited, 24, Transvaal Bank Buildings, Johannesburg; capital, £10,000.
4141. C. Lewis and Co., Ltd., 37 and 38, Royal Chambers, corner Simmonds and Fox Streets, Johannesburg; capital, £100.
4143. Sued Africa, Ltd., 31, General Mining Buildings, 58, Main Street, Johannesburg; capital, £2,000.
4144. The Exchange and Guide, Ltd., 35, Permanent Buildings, Harrison Street, Johannesburg; capital, £1,600.
4146. Ingrams, Limited, 223, Church Street, Pretoria; capital, £1,000.
4147. Elands River Quarries, Limited, Hartebeestfontein No. 210, District Pretoria; capital, £100.
4148. The Alpha "D" Co., Ltd., No. 5, Breda's Chambers, corner Fox and Rissik Streets, Johannesburg; capital, £2,000.
4149. The Gamma "D" Co., Ltd., No. 5, Breda's Chambers, corner Fox and Rissik Streets, Johannesburg; capital, £2,000.
4150. Ogston's, Limited, corner Main and Macintyre Streets, Jeppestown; capital, £7,500
4151. Central Stone Crushing and Contracting Co., Ltd., Robinson Deep Gold Mining Co., Robinson Deep Gold Mine, No. 1 Shaft, Johannesburg; capital, £1,200.
4152. The Randfontein Exploration and Development Co., Limited, No. 50, Green's Buildings, Commissioner Street, Johannesburg; capital, £6,000.
4153. Yeoville Cinema, Limited, No. 2a, Chorlton Chambers, Harrison Street, Johannesburg; capital, £1,000.
4154. Victoria Lake Mining Syndicate, Ltd., 19/20, Norwich Union Buildings, Fox Street, Johannesburg; capital, £1,500.
4156. Waste Products, Ltd., No. 14, Norwich Union Buildings, Fox Street, Johannesburg; capital, £1,000.
4158. Johannesburg Fresh Meat Supply Co., Ltd., Angehrn and Piel Buildings, Bree Street, Johannesburg; capital, £2,000.

FOREIGN COMPANIES.

4142. W. H. Allen, Son and Co., Ltd., c/o Andrew Cyril Weber, 8 and 9, Oceana Buildings, Johannesburg; capital, £200,000.
4145. Price's (South Africa), Ltd., c/o August Heinrich Ludwig Burmester, and/or 11, Saratoga Avenue, Doornfontein; capital, £100,000.
4155. The Scottish Tube Co., Limited, Johan William Cooper, Hillside, Hunter Street, Bertrams, Johannesburg, c/o Messrs. Raleigh and Rockey, Ltd., 26, Bettelheim Buildings, Johannesburg; capital, £750,000.
4157. J. Sedgwick and Co., Ltd., c/o William Endred Deeble, No. 158, Pritchard Street, Johannesburg; capital, £100,000.

ALTERATIONS AND ADDITIONS TO FOREIGN COMPANIES.

3341. Lydenburg Estates, Ltd., Johannesburg.

PROSPECTUSES.

4016. S.A. Amalgamated Jewish Press, Limited, Johannesburg.

SPECIAL AND EXTRAORDINARY RESOLUTIONS.

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1646. The Tudor Gold Mining Co., Ltd., Johannesburg; amendment of Articles.
1633. The Modderfontein Deep Levels, Limited, Johannesburg; amendment of Articles.
1623. Geduld Proprietary Mines, Ltd., Johannesburg; amendment of Articles.
1478. Lancaster West Gold Mining Co., Ltd., Johannesburg; amendment of Articles.
286. May Consolidated Gold Mining Co., Ltd., Johannesburg; amendment of Articles.
3903. Rietvallei Gold Mining Co., Ltd., Johannesburg; lease Rietvallei Mine.
2166. Planters and Importers Tea and Coffee Co., Limited, Johannesburg; amendment of Articles.
4039. Georgian Gold Co., Limited, Johannesburg; increase of capital.
2926. The Taylor-Coryell Madagascar Petroleum Syndicate, Ltd., Johannesburg; increase of capital.
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3946. Afra, Limited, Johannesburg; increase of capital.
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2525. Inhambane Oil Union, Ltd., Johannesburg: Section 196 Companies Act, 1909.
4061. Inter-Colonial Building Society and Investment Corporation, Ltd., Johannesburg; amendment of Articles.
3981. R. and J. Fleming, Limited, Johannesburg; issue of reserve shares and increase of capital.
4008. G.E.A. Syndicate, Limited, Johannesburg; increase of capital.
3714. Benoni Constitutional Club, Ltd., Benoni; amendment of Articles.

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Notes and News.

Sub Nigel. We understand that management at the Sub Nigel property, which recently entered the dividend paying list, continues to be satisfactory. The company is now under the disabilities attendant on milling with a small battery, but fair profits continue to be earned. In January, with twenty stamps and one tube mill at work, [illegible] was earned, whilst the February profit was £1,985. In connection with this mine it should be remembered that at June 30th last the company had some £113,000 cash and working capital, besides 3,100 shares in the Knights Deep, Ltd., and 3,000 shares in Breyten Collieries, Ltd.

* * * *

Knights Deep. In about six weeks' time the Knights Deep will be crushing on an enlarged basis. Further tube mills and additions to the cyanide plant to enable this tonnage to be treated are being installed, and the returns of the property soon should begin to give evidence of the effect of the enlarged equipment. With the new equipment at work, the nominal capacity of the plant will be 103,000 tons per month, but, as a matter of fact, this has already been materially exceeded in actual practice. Thus in January there were milled 111,230 tons, and during the short month of February 100,300 tons. In these two periods profits were £23,791 and £20,001 respectively.

* * * *

Ocean Freight on Bullion. The negotiations which have been proceeding between the Chamber of Mines and the Union-Castle Mail Steamship Company with a view to obtaining a reduction in the present freight rate on raw gold exported from the Union have resulted in a reduction in the rate from 5s. per cent to 1s. 3d. per cent. The agreement embodying the proposed reduction is being drafted in London, and it is expected that it will shortly be concluded satisfactorily.

* * * *

Zaaiplaats. We are advised by a gentleman well versed in tin matters who has just returned from a visit to this property, that remarkably rich developments are taking place there, and if they continue, as present indications point strongly that they will, a successful future for the company is assured. It is well known that the rich ore hitherto found on the mine was located in so-called "pipes," but those who have studied this peculiar occurrence have always strongly held that the pipes would eventually be found to connect up with the "mother" lode. The recent development above referred to gives support to this theory, as our informant states that a strong "fissure" is disclosed in connection with pipe 13 which has been traced for a considerable distance and is still being followed, giving very rich values. We purpose getting our own expert to view the occurrence at an early date and hope thereby to obtain more precise information. In the meantime shareholders appear to have a bright future in front of them as the company is now out of debt, or will be at the end of this month, and the equipment being of the best, modern type, the era of big dividends should soon be renewed.

* * * *

"Life" of City and Suburban. In the course of his speech at the annual meeting of the City and Suburban, the Chairman said: "From time to time enquiries have been received from shareholders as to the 'life' of the mine, and as these enquiries have recently been somewhat numerous, the board considers it desirable that I should at any rate place before the meeting the estimate upon which the Government bases its calculations in connection with mining taxation. Official notification has been received that the Government Mining Engineer has fixed the life of the mine for profits tax purposes at five years from 1st January, 1913. It is difficult to determine with accuracy the duration of the life of a Rand mine, and the inexpediency of proclaiming any Main Reef proposition as ' worked out ' has of late been demonstrated more than once. Taking everything into consideration, I think we may look forward to the coming year with every confidence that the output will be equal to, if not better than, the year just past."

* * * *

Rhodesian Asbestos.

A new industry will be started at Shagari, in the Hartley district of Mashonaland, in the near future, as a result of Mr. J. Joyce Wallace's discovery of asbestos, which has been adjudged by experts to be equal, if not superior, to the best Canadian chrysotile. It is described as extremely pure, of long fibre, and of the serpentine variety. Mr. Wallace contemplates sending a quantity for shipment to London in its raw state, without any sorting.

* * * *

Jagersfontein.

A bad fire occurred in one of the shafts at the Jagersfontein Diamond Mine last week. At the time the fire started two shifts were on the move, men were leaving and others arriving, and it is estimated that some 1,500 natives and about 200 white men were below just then. Considering the suddenness of the outbreak, the rapidity with which the smoke spread, and its density, it is marvellous that only four persons lost their lives. During the night from Wednesday to Thursday a huge fall of reef took place in the old open workings, literally blocking up most of the exits through which the men had reached safety the previous morning. There are now only two drives left open, the air shaft has been entirely covered, and we learn that enormous quantities of valuable blue ground have been buried to such an extent that great expenditure will be necessary to again lay them bare.

* * * *

General Mining and Finance Co.

The accounts for 1912 of the General Mining and Finance Corporation, Ltd., show a working net profit of £48,648, to which has been added the sum of £20,147 brought forward from 1911, making a total unappropriated amount of £68,795, which has been dealt with by writing off £62,841 in respect of investments, etc., a course rendered necessary by the abnormal depression prevailing in 1912, and by carrying the balance of £5,954 forward to 1913. The valuation at which the investments of the corporation are taken in the balance sheet is lower than the market valuation at the close of the financial year. No dividend will be declared for last year.

* * * *

Roodeplaat Diamonds.

We hear that great activity prevails at the Roodeplaat Diamond Mine, where genuine work is being carried on vigorously. Paddocks on the enormous pipe are now being put down and opening very well indeed, the ground looking excellent and pulverising well. Washing of the mine ground will take place as soon as the ground is sufficiently pulverised. In the meantime considerable quantities of diamonds are being obtained from the wash, and the quality is of the best. The yellow and the blue ground from the mine more than satisfies the promoters of the company. Many well-known diamond experts have visited the property lately.

* * * *

Rhodesian Progress.

Speaking at the annual meeting of the Rhodesia Chamber of Mines last week, Mr. Mitchell, M.L.C., President, said that the mortality on the mines was 35·05 per 1,000 per annum, compared with 32·97 in 1911. The industry had employed fewer boys by some 3,000, but the supply would have to be considerably augmented in the near future. He indicated that the Bureau would be able to meet their wants. He recorded a substantial progress in the gold production, in the development of the ore reserves, and in proceeding with the erection of reduction works on some larger propositions. Though during the year the tonnage crushed was less by 45,000, the average value was 35s. 3d., against 33s. 2d. in 1911. During the year 458 mines were at work, and the companies produced 70 per cent .of the gold, tributors 13 per cent., and individual workers 17 per cent., and the small workers' production showed an increase on 1911, that of the companies being a decrease. Mines approaching the crushing stage had developed 6,106,450 tons, of the value of £10,788,273, and this quantity was equal to and about four years ahead of the mills at the present rate of production. Mines now erecting plants, or those which had ordered them, would crush about 1,320,000 tons a year, which would be under the tonnage actually dealt with in 1912, so the industry was within sight of almost doubling its tonnage. Regarding the 5 per cent. royalty, Mr. Mitchell said this bore on the working profits hardly less than on the vendors' scrip basis, which it supplanted. The poorer mines were penalised or reduced to a much greater extent than was warranted, thus proving the Chamber's assertion that a hard and fast scale of payment to the British South Africa Company, when an equally certain scale of profit was not provided for, was unfair. The Rhodesian mining industry was more heavily taxed than any other gold mining country in the world. A fair basis and the only one which would tax every mine on its merits was a system of profits' tax, and in this connection he drew frequent comparisons with the Transvaal.

* * * *

International Ceological Congress.

At the last meeting of the Institution of Mining and Metallurgy in London the subject of the International Geological Congress, 1913, was discussed at some length. Mr. J. B. Tyrrell remarked that as they were aware, possibly, there was to be held in Toronto next August a Congress of geologists and mining men. The original statement announced that it would be on the 21st August; but they had advanced that time two weeks, so that the meeting would now be on the 7th. At least half of the members of the Council of the International Geological Congress this year were economic geologists, men who were interested in the development of the mines of Canada and the United States mostly. It had been the endeavour of those geologists, with the assistance of the others, and with their thorough co-operation, to have discussions in Toronto, at the meeting of the Congress, which would be of a thoroughly economic character. One of the discussions to be held was on the coal resources of the world; another was on the changes in character of ore bodies with depth; another was on the magmatic segregation of ore bodies—all subjects which were of exceeding interest to mining men. We believe that Dr. E. T. Mellor, of the Transvaal Geological Survey, may be asked to attend the Congress as a representative of this country.

* * * *

Dust in Mines.

Apparently the question of allaying dust in mines is bulking largely in the plans of mining men all the world over. We take the following from the current issue of the *Mining and Scientific Press*, of San Francisco: Dust in coal mines is a prolific source of explosions and in metal mines is the leading cause of miners' phthisis. In South Africa determined efforts have been made to lessen the danger of the latter by regulation of the use of small air-drills. In Nevada a bill has been introduced in the State legislature prohibiting the use of machine drills save in connection with water sprays or other efficient dust reducing apparatus. Since there are several means that may be employed, this is fair to all manufacturers.

* * * *

New Vaal River Diamonds.

At the annual meeting of New Vaal River Diamonds last week, the chairman said that the first six months of the present financial period the output of diamonds amounted to £124,770, and therefore exceeds in value that of any previous twelve months of the company's existence, and since the end of December the average weekly production shows a further considerable improvement. Revenue from other sources than royalty has also been satisfactory, and shows substantial increases, as, for instance, that derived from claim licences, which has more than doubled itself, whilst cash assets, which stood at the end of June at £37,000, now amount to close on £60,000. The directors have therefore decided to recommend a distribution of profits on the basis of an interim dividend of 10 per cent., and whilst admitting that the estimated profits made since June last would have permitted of a larger dividend, they have considered it prudent to keep back a portion of the profits towards the payment of a further dividend for the 18 months, and at the same time maintain and even improve their financial position.

* * * *

Extending Use of Nissen Stamps. It is probable that the next year or two will witness considerable extension of the use of the Nissen stamp in South Africa. On the Rand employment is at present restricted to the few heads at the City Deep, but we anticipate that the next new Further East Rand mills will be equipped with primary crushers of this type. It is interesting to note that at the Fairview mine at Barberton, belonging to the Transvaal Consolidated Land Co., Ltd., two stamps have been crushing to ¼in. mesh at the rate of 35 tons per stamp per day; two stamps are also in use at the Rietfontein in the Lydenburg district. The Consolidated Gold Fields of South Africa has decided to make the Nissen stamp the standard type for future construction and has ordered a large number for its mines in Rhodesia; namely, 56 for the Shamva, 36 for the Falcon, and 24 for the Golden Kopje. The plant at the Planet-Arcturus will also be equipped with them, but many smaller mines in Rhodesia and outlying parts of the Transvaal have adopted the stamp. Most of them are gold mines, but an interesting exception is the Leeuwpoort tin mine in the Rooiberg district, in the northern Transvaal.

* * * *

Geduld's New Plant. The profit of the Geduld Company for last month was £4,250, which does not compare unfavourably with £4,754 in the longer month of January, when 3,000 more tons were crushed. The result was, too, affected to some extent by changes in the mill in connection with the extension of the equipment. Hitherto the company has been employing 50 stamps and 2 tube mills and in January last 14,200 tons were milled. Construction is now well advanced in connection with the erection of a further 10 heads and two tube mills. This will bring the total capacity up to 24,000 tons per month, and it is expected that the new equipment will commence working in about two months' time. Underground the position is eminently satisfactory. During the past year development has been energetically pushed ahead. At the end of 1911 there were over 700,000 tons based on 44·2 inches milling width and by linear assays (reduced) indicating an average value of 38s. 7d. per ton. In the absence of an official statement as to reserves at the end of 1912 we are unable to give any recent figures, but it is certain that during the past year the reserves have been substantially added to.

* * * *

A New Rhodesian Prospect. It is reported from Bulawayo that an option has been acquired over the Great Bear property, in the Bembesi district, by the Amalgamated Properties, and that development operations already have commenced. It is said that the gold occurs in a banded ironstone formation traversing a low ridge. The owners prospected the ground pretty thoroughly and sank a winze on the reef in which good values were encountered. On the surface, gold has been traced throughout three blocks of ground, over a lode running up to 40 or 50 feet across. The property is therefore one which should commend itself to any capitalised concern giving ample scope for the carrying on of operations on a large scale. It is understood that the lode is on the same series as that opened out on the Pompadour some five miles distant, on which property a considerable quantity of development has been carried out and good values disclosed. Unfortunately, banded ironstone does not as a rule commend itself to the small man on account of the low values which are generally found in it, necessitating plant on a large scale and, naturally, the expenditure of a big sum on development work. With the assistance now given by the Chartered Company, more extensive development should be possible.

TOPICS OF THE WEEK.

THE MINES AND THE BUDGET.

The end of last week and the beginning of this were marked by the presentation of the Union Budget and its supplement, the railway statement of accounts. General Smuts, the Minister of Finance, in explaining the figures for last year and this, was rather disappointing, and made on the whole a very colourless speech. Summed up, the position seems to be briefly this: For the year 1912-1913 the estimated revenue was £16,282,000; actual revenue, £17,314,000. Estimated expenditure, £17,320,000; actual expenditure £17,196,000. Estimated deficit, £842,000; actual surplus, £118,000. But this surplus for 1912-1913 includes £73,000 bewaarplaatsen receipts to be deducted. Therefore the net surplus for the current year is £75,000. For the year 1913-1914, the estimated expenditure is £16,165,510; estimate revenue, £15,212,000; leaving an estimated deficit of £953,000. This is to be met by the appropriation of the net surplus of the year 1910 to 1911, £770,000, leaving a net estimated deficit of £183,000, to be met out of accumulated bewaarplaatsen funds. A satisfactory feature is that there is to be no new taxation, and the Minister said nothing about any alteration in the Customs tariff. From the industrial point of view, it is noteworthy that the total exports for 1912 were £64,262,000, as against £57,308,000 for 1911. To get at those figures the amounts for diamonds, gold and specie had to be deducted, and then the result was, for 1912, £15,158,000, as against £13,684,000 for 1911. That gave a total increase in exports of £181,000, including coal. To that increase maize contributed £41,000, wool £880,000, and ostrich feathers £336,000. A remarkable fact was that the exports of South Africa to Rhodesia had increased by £115,000, and some new arrangements that had been made would, it was expected, show a fair increase in South African exports to territory beyond Rhodesia, and Congo territory. The Customs showed an increase of £80,000 over what was anticipated. The Post Office showed an increase of £156 000 over the estimate, and there was an increase of revenue from diamond mines of £150,000 over the estimate. General Smuts opined that the revenue from gold mines appeared likely to remain at about £210,000 for the next three or four years, as the gold mines seemed to have reached high-water mark, and until new Government areas were in operation, four or five years hence, there was not likely to be any increase of revenue from them, unless, as Sir Percy Fitzpatrick interposed, they succeed in reducing working costs. In diamonds there had been an increase in the value of production of £1,314,000 over last year. For 1912 the production of coal was 8,170,000 tons, of the value of £2,000,000, an increase of more than half a million in value over the previous year. Copper had not moved very much. Tin had gone down slightly. The total mineral production of South Africa to date—as valued by the Customs—was: Gold, 363¼ millions sterling; diamonds, 170 millions; coal, 25 millions; copper, 9½ millions; and tin 1¼ millions. There had been, General Smuts pointed out, the greatest additional revenue from increased diamond production. Estate duty had yielded £258,000, an over-estimate due entirely to a windfall from the estate of Sir Julius Wernher, which had come under the Transvaal duty. There were considerable assets of this estate in the Cape, but, so far, they had received practically nothing under the Cape Act. Transfer duty had gone up by £85,000, which was almost entirely from the Cape and the Free State. That showed that there had been considerable land transactions, but also that the actual value of land had increased. The stability of mining, and the increasing agricultural and industrial activity implied by the growing Customs and other revenue receipts, are pleasing features of the Budget review. The forward movement in farming has no doubt been responsible for much. No one will regret such losses of Customs revenue as result from larger internal production. The monthly statistics showing the quantities and value of articles imported which are capable of being produced within the Union, published from time to time in our columns, furnish a striking illustration of the amount of leeway which South Africa has still to make up in this respect. On the other hand, the deficit foreshadowed by General Smuts, carrying in its train the threat of further taxation and the airy way in which he suggested that Parliament might vote to the Treasury the whole proceeds from bewaarplaatsen are distinctly unpleasant features.

Turning to Mr. Burton's railway budget, we find that the Department has surrendered railway profits which are estimated to represent a saving to the public of £1,335,900 per annum, though many of the reductions may be more than paid up for by increased traffic under the heads benefited. The Minister shows that the benefit to the Transvaal has been £567,500, as compared with £524,000 that has gone to the Cape, £137,000 to Natal, and £107,400 to the Free State. There is a surplus of half a million, and Mr. Burton has an extra half million to dispose of in the coming financial year through the absence of any call for a contribution to the Union Exchequer. Yet Mr. Burton now declares that the resources at his command are no more than sufficient to meet the needs of the Department and that it is hopeless for the Rand or any other centre to expect additional relief. The other proposals of the Minister for Finance and the Minister for Railways are now being subjected to a searching criticism in the Assembly, and we shall have something further to say when we have the chastened replies of both Ministers before us.

THE PLIGHT OF THE COAL INDUSTRY

Both Mr. G. R. Airth, who presided at the annual meeting of the Anglo-French Coal Estates, and Mr. Dale Lace, the Chairman of the Cassel Coal Company, drew forcible attention to the attitude of the Government towards the coal industry. Mr. Airth contented himself with pointing out that a further reduction in the railway rate on coal was necessary before the export trade could hope to realise its possibilities. Mr. Dale Lace, however, went much further and dwelt in no uncertain fashion on the neglect of the industry by the Government. He admitted that the trade had increased from 128,530 tons in 1911 to 366,058 tons in 1912. He pointed out, however, that this country was only able to secure an increased share in the oversea trade owing to strained conditions—strikes and other causes—obtaining in other countries, and not to the shilling per ton rebate. For grudgingly permitting them to load coal into trucks which would otherwise return empty to the coast, the railway took the larger share of the shipment price of coal. Instead of the railways encouraging the trade, all the collieries have a continuous fight to get trucks, and closing down for lack of trucks is quite an ordinary experience. Mr. Dale Lace put it on record that telegrams and letters, individual appeals, deputations—all with the same weary object of getting trucks for the coal traffic—have been going on for years, and the position is worse to-day than it has ever been—a positively scandalous condition of things. Continuing, he said, in the course of a very convincing speech: "The coal is good, it is cheap, it is wanted in South Africa and out of it, and I would appeal to our Government, which I sincerely believe to be actuated by the best wishes for the good of the country, to insist on the Railway Administration carrying out the spirit of Clause 129 of the Act of Union, which says, 'The Railways . . . shall be administered on business principles.' Given a fair railway rate and reasonable truckage facilities, the Middelburg collieries will have a good share of the world's trade. As things are, we are the Cinderella of South African industries. The whole world is crying out for coal and the Associated Collieries have an unlimited supply of it to offer. But while the South African octopus will give us neither rates nor trucks, we must struggle on from hand to mouth, circumscribed in enterprise and energy, deprived of that place in the sun which is our just due. I say advisedly, 'our just due.' Owing to the cryptic manner in which the Railway figures are presented, it is difficult to give the exact percentage of profit earned by their Witbank-Springs coal line, but I am quite safe in saying that it is paying over 50 per cent. per annum net profit, and, from what I know of the construction cost of this line, I should say the real profit is more likely to be in the neighbourhood of 100 per cent. per annum. Knowing the miserable results achieved by the hundreds of miles of non-paying railways in other parts of the Union—I will not specify which, for fear of being reproached as provincial—you can readily see who is footing the bill. So I say, with all the emphasis of which I am capable, that the present strangling policy should cease, and that the coal trade should be treated not only with bare justice, but with the generosity an industry so vital to the country deserves. Every additional ton of coal exported means more revenue to the Railways, more wages earned, more wealth retained in the country, more money in circulation, and it should be the fixed policy of the Government not only to place no obstacle in the way of the coal export trade, but if necessary to go out of its way to facilitate that trade by every means in its power." It may be added that these strong views are shared by practically all the coal mine owners in the Transvaal. They are, we understand to be submitted to the Government by a representative deputation shortly, and if the remarks made by Mr. Burton in the House of Assembly this week, embody the whole case for administrative apathy, it is difficult to see how the Government can refuse the industry the small measure of practical encouragement demanded.

THE WATER QUESTION.

The important question of mine water supply called forth some interesting remarks from the President of the Chamber of Mines, Mr. John Munro, at the monthly meeting of that body on Thursday. Mr. Munro mentioned that over two years ago it became apparent to the members of the Rand Water Board that the sources of supply under their control would be insufficient to meet the requirements of the rapidly increasing population of the various municipalities within the area of supply, and the demands consequent on the expansion of the mining industry of the Rand. It was decided by the Board under guarantee from the mines and municipalities that a new water scheme should be installed to secure a further supply, and the Chief Engineer to the Board, after a most exhaustive examination of all possible sources finally recommended that the new scheme should draw its supply from the Vaal River. It was anticipated that this proposal could have been definitely agreed on by the various constituent bodies of the Board in time to permit of its introduction in the form of a private Water Bill during the present session of Parliament, if certain Standing Orders of the House could be suspended. Owing, however, to the desire expressed by the representatives of the municipalities that more time should be afforded in order that the proposal of the chief engineer should be more thoroughly investigated and considered, the idea of proceeding with the proposed Bill during the present session of Parliament had to be abandoned. In the meantime all data necessary to support the scheme are being collected and tabulated, and it is hoped to present the Bill at the beginning of the next session of Parliament. In order, however, that a temporary increase to the present supplies of the Water Board may be obtained, representations have been made to the Government praying for sanction empowering the Board to draw water from the shaft belonging to the Western Rand Estates Company, on which operations had to be suspended some time ago in consequence of the large inflow of water. Even in the unlikely event of further good rains, it is feared that the sources of supply under the control of the Board and the dams owned by the mining companies will not be sufficient to meet the requirements of the municipalities and the mines at the end of the next dry season. In order that the seriousness of the position might be adequately represented, a deputation from the Water Board recently waited on the Government in Capetown, and the decision of the Cabinet is anxiously awaited, not only, it may be said, by the mines, but by all of us who live directly or indirectly by them. The deputation, it is to be hoped, will return with more reassuring information than that conveyed in the brief and bald statement of the Minister of Mines in the Senate on Thursday.

WHAT ARE ORE RESERVES?

Estimates of Ore at the Rooiberg—Lode Reserves and Supplementary Fillings—What Are Indicated Reserves?

About a week ago, "in view of the rumours which have been current," as it was explained in an official communication, the secretary of the Rooiberg Minerals Development Co. was instructed to give certain details with regard to the ore reserves at the mine, taken from the report of the Consulting Engineer. The statement went to show that the ore reserves, as actually indicated by development, amounted to 22,600 tons, that ore indicated as available from supplementary fillings, in excess of the quantity just mentioned, and from prospecting and exploratory works, totalled 90,300 tons, that accumulated, partly treated products amounted to 36,000 tons, and that the ore at grass amounted to 2,600 tons; making a total, altogether, as at January 31st, 1913, of 151,500 tons, or, say, at least four years ahead of the mill on a basis of 3,000 tons per month. The average value of these estimated reserves was put as being equal to the present average grade, viz., 3·5 to 4 per cent. metallic tin. The manner of expressing the position would seem to leave no room for misunderstanding with regard to the character of the reserves in question. In spite of the plain meaning of the terms used, however, the company has been asked to be a little more explicit, and it would appear that the anxiety to obtain information as to the precise meaning of the word "indicated" is rapidly developing quite an agitation among a certain section of the shareholders. As we have already had occasion to observe, the mere statement that the ore reserves as at the 30th June, 1912, amounted to 21,300 tons, might require some explanation, in view of the facts that there were 21,650 tons at the same date in 1911, and that only 8·9 per cent. of this latter reserve was drawn upon during the year. Since development was carried on actively during the same period the obvious conclusion would be that very little new ore had been opened up, and that development was not keeping pace with the mill. The consulting engineer has from year to year endeavoured to make it clear that the characteristics of the Rooiberg lodes are such that development footage is in itself no reliable guide to the quantity of profitable ore which may be opened up by it, and in the last annual report the manager referred prominently to the same circumstance. "Attention is drawn to the fact," he remarked, "that in ore deposits of such irregular character as these are, too much weight should not be attached to the quantity of ore developed per foot driven. The absence of payable ore at a given point in two successive levels does not necessarily denote the absence of ore between those levels, and often rich ore is found in pockets off winzes which was not in the least indicated by so-called development. In this connection it may be pointed out that of the total tonnage mined during the year, only 8·9 per cent. was derived from previously indicated ore reserves, so that the figures above given as representing the ore reserves may be considered as very conservative estimates." A reference to the annual reports of the company will suffice to show that the greater percentage of the ore milled, with excellent results, by the way, has been obtained from sources outside what may be considered as drive disclosures. For the 27 months ended the 30th June, 1911, only 33 per cent. of the whole quantity milled came from the estimated reserves, while 53 per cent. came from what are known as supplementary fillings. To those who are accustomed to the banket reefs of the Rand, where the payable ore is confined, practically, to the actual reefs and the rock immediately adjoining the planes of contact between the reefs and the enclosing country rock, it is not readily apparent that the lodes at the Rooiberg, which are not stratified beds but fissures cutting directly across the strata, are really less important sources of ore than the subsidiary fissures and chambers which are discovered during the process of stoping. For development purposes it is more convenient to follow the lodes themselves, which often carry large portions of payable ore. As a result of working these profitable portions information is gained with regard to the irregular masses of ore in their vicinity and facilities are afforded for mining them.

Two Classes of Ore.

Because the lodes are followed in the drives and ore reserves are calculated from the measurements and values disclosed along these drives, the average Rooiberg shareholder seems to have got the idea into his head that the assets so estimated are actual assets while the indicated tonnage of the supplementary ore bodies are merely mythical. As far as actual working has gone these additional and unforeseen sources of supply have proved the most important and reliable in the mine. This is evident from the fact that of all the tonnage milled to the end of June, 1912, about 67·2 per cent. came from the latter and only 20·9 per cent. from the former sources. Experience has demonstrated that these accessory supplies are quite as much to be relied upon as the drive ores, and if after using the careful methods of calculation which prevail at the Rooiberg the consulting engineer estimates that there are 90,300 tons of ore, including prospecting and exploratory disclosures, in and about the mine, in addition to 22,600 tons on the drives themselves, he is, in our opinion, speaking on a conservative basis. Although the term "indicated" is used to qualify the larger quantity, the ore so indicated is not necessarily less probable than that which is calculated from disclosures in the drives. The existence of the latter is no less problematical, as a matter of fact, that the former. In all questions of ore reserve estimates the element of probability enters very largely. A risk factor, which can only be fixed approximately, after long experience and a thorough study of the characteristics of the ore body and its habits, must be used in order to minimise the risk of error. This means of reducing the possibility of risk is quite well understood at the Rooiberg and is very conscientiously employed upon all occasions. Returning to the subject of the report it may be pointed out that the habit of caution referred to is sufficiently well marked in the statement that 90,300 tons of ore are "indicated." It is not stated that they are actually in existence, and if the curious shareholder desires further information with regard to the matter the obvious way of getting it is to consult the reports of the company and a standard dictionary.

Rooiberg Estimating Methods.

It will be of interest to explain the system upon which the ore reserves are estimated at the Rooiberg mine. Upon the Rand, when a block of ground has been divided off from the remaining ore body, by means of drives and winzes exposing its four sides, measurements and values are taken at regular distances around the whole perimeter of the block, and averages calculated over a tonnage which comprises the whole block, whatever the distance may be between the levels and winzes respectively. Not so at the Rooiberg. Here, as a drive advances the average widths and values are only held to affect the ore body within a distance of 10 feet above and below the level, and 10 feet upon each side of a winze. Whatever ore is indicated by measurements taken beyond these limits as stoping or subsidiary development progresses is "indicated" ore, and as such would be included in the category of the 90,300 tons mentioned above. That is to say, as work extends beyond the 10 feet limits above or below a drive, new faces with new widths and values are exposed. The average tonnage and metal contents of the ore within 10 feet of these faces are considered as "indicated," and not as reserves under the heading No. 1 as they might justifiably be recorded. Ore bodies off the lode, after measurement and sampling are included in the same category. There is, therefore, nothing of the ultra-hazardous or mythical about the estimates submitted by the consulting engineer. If calculations were made upon the usual Rand system, which is, of course, fairly reliable for the purpose for which it is employed, the Rooiberg reserve tonnage might easily figure at several times the quantity stated in the recent circular. The desire to obtain information is a laudable one, generally, whatever be the subject of enquiry. In this apparently foolish excitement about a statement which seems obvious enough, however, one is inclined, perhaps unreasonably, to see some trace of that persistent bear attack upon the Rooiberg shares which has been a feature of the market for a very long time past. The growing tin industry of this country has had to face many obstacles; not the least of them, as the history of the Zaaiplaats mine bears confirmatory witness, has been the discreditable opposition of those who might have worked effectively and advantageously in the opposite direction.

MINE AMALGAMATION IN THEORY AND PRACTICE.

Unforeseen Additions to Working Cost—The "Wholesale" Ideal Not Attained—Limits of Safety in Amalgamation.

The extremely interesting paper on the centralisation scheme at the Crown Mines, which was read by Mr. Ruel C. Warriner at the last meeting of the South African Association of Engineers, throws some useful light upon a great many points which have an important bearing upon schemes of "wholesale mining," and which cannot be properly appreciated without the aid of actual experience. Some of the new conditions which present themselves when the scale of mining operations is greatly enlarged may be due to circumstances which have no connection therewith, while others are more or less involved in the complete carrying out of such a scheme. The case of the Crown Mines, as elucidated by Mr. Warriner, gives instances of both kinds. In the first category are the increased cost of labour which resulted from competitive recruiting, and the additional expenditure which followed upon the introduction of sand-filling, water service against dust, and miners' phthisis insurance. The total extra cost under these heads at the Crown Mines, since amalgamation, is put at 12·6 pence per ton milled. To these may be added the sum of 6 pence, roughly, per ton milled, as representing the cost of changing over to an eight-hours day, making a sum, altogether, of 1s. 6·6d., which may be regarded as an unforeseen charge, which, although not incidental to any plan of enlarged mining, has, nevertheless, a considerable bearing upon its successful operation. It is, moreover, as costs go upon the Rand, one that cannot be looked upon with indifference.

Under the heading of conditions involved in the scheme itself, there is to be included the difference in the system of mining at the Crown Mines, as the result of which only 18·5 tons were mined per fathom broken in January, 1913, as against 22·5 tons per fathom during four months in 1909, the balance in favour of the latter period being due to rock taken from the footwall. Theoretically, a policy of "wholesale mining" implies that a lower grade of ore may be worked at a profit, but actually, as in the case under discussion, the greater the capital expenditure incurred the less justification is there for milling waste and low grade rock, which can conveniently be left in place. This cleaner stoping policy at the mine in question has added, at a very conservative estimate, according to Mr. Warriner, something like 1s. 8d. per ton milled to the working costs. The difference between the Crown Mines and other properties where an enlarged plan of operations has been entered upon, is that in the former case a programme of closer mining was definitely decided upon in advance, while in others it has apparently been a matter for subsequent consideration. It would take too long to discuss the important bearing of unforeseen conditions of this kind upon the success of a vast mining undertaking which has been commenced without an adequate appreciation of them, and still more upon the prospects of one that has been inaugurated without any consideration of them at all. Those who are interested in the subject will find much that is instructive in the well-known report of Mr. Ross E. Browne and in papers read before the Institution of Mining and Metallurgy and the South African Association of Engineers on the most profitable life of a mine and similar problems, in which the yield per ton, working costs and net profit per ton milled on an ascending scale of operations are assumed to be capable of expression by means of a curve which may be relied upon for business purposes. Experience goes to show that the smoothly flowing curve of theoretical assumption and the irregular line of practical results are sufficiently at variance to render the former a decidedly untrustworthy guide.

THE LIMIT OF SAFETY.

In all schemes of "wholesale mining" based upon vast claim areas there is one element to be considered which is of vital importance, but which does not seem to have had that amount of recognition which it deserves. In most, if not all, the papers which have been written on the subject of "wholesale mining" the factors which seem to be regarded as the controlling ones are capital expenditure on the one side and total net profit upon the other. The element of time is involved in the question of capital expenditure, inasmuch as the present value of profits is calculated upon the life of the mine, and the latter depends upon the rate at which it is possible to work it out, and therefore upon the dimensions of the plant erected. It should be obvious, however, that the actual size of a working mine, apart from the time in which it can be exhausted, is a factor in the calculation which must have some reasonable limits assigned to it. A concern which may without inconvenience crush 200,000 tons per month may be courting disaster if it aspires to increase its crushing to 250,000 tons, for example, and not only is the size of a working mine limited by the conditions of the mine itself, but by the mental and physical capacity of a manager and his ability to exercise that degree of control which is commensurate with his responsibility. It will scarcely be denied that no matter how large an undertaking may be it is necessary that a manager should be in close touch with his mine, and, given this condition, it will hardly be maintained that the system of sub-managers and subordinate officials which a great amalgamation brings in its train, sooner or later, secures this in an adequate manner, unless with exceptionally good methods of organisation. Leaving the personal element out of the question altogether, however, the ability of a mine to meet the demands of a huge mill with safety is clearly not unbounded, however great its area may be. It would be absurd, in short, to maintain that because the Crown Mines can run its 800 odd stamps without doing an injustice to the mine, the same number may quite as readily be put into commission upon a property of similar or even greater size elsewhere upon the Rand. It may be doubted whether this matter of a proper adjustment between milling capacity and facilities for mining payable ore has been as thoroughly investigated as it ought to have been when forecasts of future profits have been made by amalgamating companies on the Rand. It is gratifying to find that it has not been lost sight of by the engineers of the Crown Mines.

THE MANAGER AND STAFF OF THE NEW PRIMROSE.

Front Row.—P. W. Eddey, storekeeper; W. M. Munro, surveyor; D. M. Macleod, battery manager; S. F. Franco, mine captain; P. P. Retief, mine captain; J. L. van Eyssen, manager; W. S. Skinner, engineer; C. J. Clark, secretary; D. McL. Barrie, cyanide manager; R. Bodley, compound manager, M. T. Dixon, assayer.

Second Row.—W. Hutton, battery foreman; J. H. Hurford, assistant native timekeeper; G. W. Marshall, native timekeeper; W. G. Ashburner, sampler; D. C. King, battery foreman; G. Tait, assistant storekeeper; G. E. Kemble, shift boss; R. E. C. le Sueur, assistant compound manager; N. Mullen, foreman blacksmith; A. Jenkin, shift boss; L. E. N. Difford, chief clerk.

Third Row.—J. B. Robertson, foreman fitter; W. A. Lewis, shift boss; R. Stead, assistant surveyor; R. Trevethan, foreman carpenter; H. N. Dempsey, cyanide foreman; A. S. M'Adam, assistant assayer; J. H. Higgins, surface overseer; H. Grigg, assistant sampler; W. H. Dexter, native hospital superintendent.

STRUCTURAL FEATURES OF THE WESTERN WITWATERSRAND.

Excerpts from Dr. Mellor's Recent Paper—Tripartite Division of West Rand Areas—The Country North of the Witpoortje Fault.

The following extracts from Dr. Mellor's paper on "The Structural Features of the Western Witwatersrand," which was read before the Geological Society of South Africa recently, and is a continuation of the subjects dealt with in his two previous contributions to the Transactions of the same Society, will serve to illustrate his principal findings. When the paper is finally published, it will be accompanied by valuable maps and sections which are still in course of preparation. Read in conjunction with the geological sketch map of the district, which first appeared in our issue of the 1st March, the quotations we give herewith will be easily understood by those who have some knowledge of the country referred to.

After discussing the matter of comparative composite sections taken across Witfontein, supplemented by observations on the neighbouring farms Hartebeestefontein and Droogeheuvel, and across the Central Rand respectively, Dr. Mellor proceeds:—

"If the sections be compared it will be at once evident that there is a considerable increase in thickness in the West, as compared with the Central Rand. Taking the beds from the base of the system up to the top of the Government Reef Series this increase amounts to about 50 per cent., but does not appear to be constant throughout the various sub-divisions. The greatest increase in thickness is shown by the Hospital Hill Series and that portion of the Government Reef Series classed as Promise Beds, where the thickness is about twice that shown in the Central section. In the Coronation and Government Beds, especially the latter, there is practically no material difference as compared with the section about Florida. Apart from the increased thickness shown by portions of the section, as noted above, there is a very close similarity between the two, and the sequence of the main bands of quartzites and shales is the same. All the best known distinctive horizons of the Central section can be recognised in the West, the Government Reef and Coronation or West Rand Slate having practically identical characteristics in both localities. With the increase in thickness shown by the Hospital Hill Series and the Promise Beds there is observable a corresponding increase in the coarseness of the sediments. The 'sago-bands' of the Hospital Hill Quartzites are often very coarse in character, and the prominent grit bands found in the quartzites of the Promise Beds become persistent bands of conglomerates, which about Witfontein are known as the Witfontein and Bertha Estate Series of pebble 'reefs.'"

UPPER WITWATERSRAND SECTIONS.

Although it is not intended to give any detailed account at present of the Upper Witwatersrand System, the following remarks are considered necessary in connection with the subject under review:—

"One of the most important questions is that relating to the extent to which the *Elsburg Beds* are represented in the West Rand. The strong local development of these beds, and the coarseness of the numerous conglomerates which form part of them is familiar to all acquainted with the Central Rand. Followed westwards, however, they show a considerable diminution in thickness, while the conspicuous and large pebbled conglomerates become less and less marked in character. In the area to the south of Krugersdorp it is difficult to find any beds which can be regarded as distinctively Elsburg. Those who regard the Elsburg Beds as unconformable to the Witwatersrand System might maintain that the unconformity itself was sufficient explanation of the absence of the Elsburg Beds on the West Rand. The Amygdaloidal Diabase of the Ventersdorp System, with which the Elsburg Beds are placed by those who regard them as unconformable to the Witwatersrand System, is, however, well represented to the south of Krugersdorp, and the base of the diabase sheet still maintains the apparent conformability to the Kimberley reefs and other horizons of the Upper Witwatersrand System which it shows in the Central Rand. Both immediately south of Krugersdorp and still further south about Doornkop, on the further side of the Witpoortje Fault, as well as eastwards on the north-eastern portion of Vlakfontein and westwards on Middlevlei the base of the diabase sheet shows a close conformability with a series of pebble beds associated usually with rather easily weathered quartzites or sandstones, of which the uppermost member is known as the Steyn Estate Reef. Whether the Elsburg Beds are regarded as forming a portion of the Witwatersrand System or not, the great thickness of quartzites and conglomerates of the Central Rand appears to be represented in the West by a few pebble beds below the base of the Amygdaloid and some associated sandstones, so that the strongly developed Elsburg Beds of the Central Rand are in any case but feebly represented in the West. Such thinning out of the Elsburg Beds would be quite in keeping with the behaviour of the big conglomerate beds as they are followed in a westerly direction. Nor is this thinning-out westwards confined to this portion of the Upper Witwatersrand Section, as compared with the Central Rand. My observations so far seem to show that there is also a very considerable thinning-out of the whole Upper Witwatersrand System, which is shared by all members of the sequence. The obvious thickening of the *Lower* Witwatersrand System on the Western Rand has led to an opinion genarally prevailing that the whole system is thicker in that district than in the Central Rand. The thickening, however, appears to be mainly in the middle portion of the Lower Division of the system, while in the Upper Division, on the contrary, there is an actual decrease in thickness. It need scarcely be said that the question of the thinning-out of the Upper Witwatersrand System on the West Rand has a most important bearing both on the accessibility of the Main Reef horizon in certain portions of that district and on the probability or otherwise of its maintaining its characteristic features in districts still further west."

A THREEFOLD DIVISION.

The wide and complicated area of the Western Rand is treated by Dr. Mellor in three portions, as marked off naturally by two principal lines of faulting. These areas are the country north of the Witpoortje fault, that lying to the south of it, and finally the district which is situated to the west of the West Rand fault. In two of these areas, although disturbed more or less by other lines of faulting, the whole Witwatersrand System is pretty fully developed; in the third only the lower division is represented, but, as if to make up for this deficiency, it is developed in a particularly extensive sort of way.

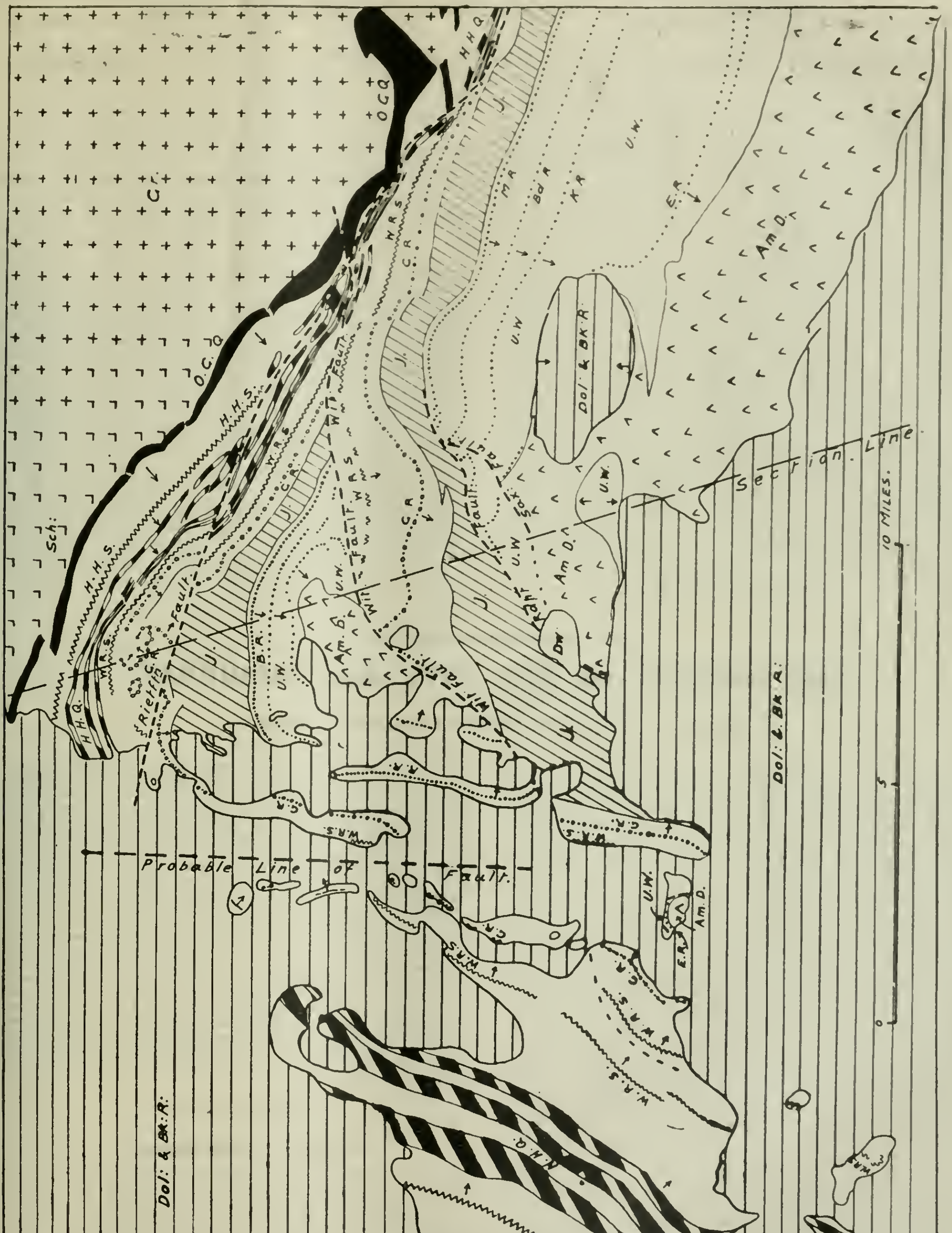
NORTH OF THE WITPOORJE FAULT.

The country north of the Witpoortje fault is first dealt with, and of this the author says:—

"The country to the north of the Witpoortje Fault occupied by the Witwatersrand System forms a triangular area, having the fault line as its base, its apex being situated about four miles north of the town of Krugersdorp, on the north-western portion of the farm Honingklip. Within this triangle the whole succession of the Witwatersrand System is represented, from the Orange Grove Quartzites along its north-eastern side to the top of the Upper Witwatersrand System on Luipaardsvlei, and there is also represented as well, the Amygdaloidal Diabase, which overlies the sedimentary rocks. The sequence presented is closely similar to that seen on the nearest portions of the Central Rand. A broad zone along the two sides of the triangle is occupied by beds of the Lower Witwatersrand System, the formation making a sharp bend in the neighbourhood of the south-eastern corner of Sterkfontein, and a similar course is followed by the outcrops of all the succeeding higher beds, including those associated with the Main Reef Series. . . . ."

"Throughout this stretch of country the Orange Grove Quartzites pursue a very regular course and continue, as in the Central Rand, to present towards the lower country occupied by the Older Granite to the north, a bold escarpment interrupetd only by occasional deeply cut kloofs like that of Witpoortje. The broad belt of shales (Parktown Beds) which succeeds the Orange Grove Quartzites, and which is so intersely compressed north of Roodepoort, opens out to something more than its normal width, owing to minor duplications, often very clearly shown by the outcrops of such distinctive beds as the Water Tower Slates and the Ripple-marked Quartzites. Above this broad belt of shales conditions are by no means so simple, as will be seen from the mapping of the Hospital Hill Quartzites and of the Government Reef Series between Roodepoort and Krugersdorp, the disturbances shown by these beds being largely due to the effects of the *westward continuation of the Rietfontein Fault*. This fault has been described in previous papers, in connection with the Central Rand, of which it forms the dominant structural feature. It is prolonged into the Western Rand and continues to exhibit characteristics very similar to those shown further east. From the neighbourhood of Maraisburg, to which point it has previously been traced, it continues in a north-westerly direction and approximately in a direct line to the northern portion of the township of Krugersdorp, which it traverses, passing onwards across the northern corner of the farm Waterval, to be lost under the Dolomite near the southern boundary of Sterkfontein. As is so markedly the case on the Central Rand, the strata on the southern side of this fault continue to show very high dips, while those on the north are inclined at a much lower angle. Along its course also there continues to be considerable shearing and duplication of the adjacent beds. . . . ."

"In the imperfect basin formed by the Government Beds on the northern portion of Paardeplaats, north of Krugersdorp, high dips prevail in the lower portions, and there is a marked crowding together of the outcrops of the numerous quartzites. In the upper portions, on the contrary, the beds are disposed in shallow folds, the duplicated portion of the Government Reef and its overlying quartzite lying in places practically horizontal. This disposition of the Government Reef leads to the meandering outcrop shown by it in this



SKETCH MAP OF THE GEOLOGY OF THE WESTERN WITWATERSRAND (AFTER E. T. MELLOR.)

locality, and has led to its being sometimes regarded as a separate reef named after the Alexandra Estate. Its position is, however, fully explained by the local structure, while the characters shown by the reef leaves little room for doubt as to its identity. South of the line of fault, which bounds this small folded area, the Government Reef can be picked up again with certainty on the north-eastern portion of the farm Waterval, where in common with other beds of the Government Series it still has an east and west strike, which changes gradually to a north and south direction as the outcrop of the series turns to the south and courses across the middle of Waterval. The Government Reef itself can be followed without difficulty round the borders of the Ruislip property southwards across the deep valley of the spruit, near which the lime works are situated. About a third of a mile south of the spruit the Government Reef and its overlying quartzite become covered by the Black Reef Series, to reappear about a mile further south, and continue at the surface from this point to near the southern boundary of Waterval, where the outcrop is again hidden by the Black Reef Quartzites for a short interval. The Government Reef reappears on the farm Randfontein, and after traversing about a third of its length finally curves westwards, to again disappear under the Black Reef formation. The interruption in the outcrop of the Government Reef by the unconformable covering of Black Reef Quartzites on the middle of Waterval has apparently been the ground for regarding the outcrops of the same horizon on the southern portion of the farm as something distinct, the name of 'Penwith Reef' being given to the bands of conglomerates in this locality. The disappearance of the Botha's or Main Reef Series under the same patch of Black Reef formation to the east has led to a suggested correlation with the Government Reef on Waterval. Although, however, the Government Reef horizon itself cannot be followed from its northern to its southern outcrop on Waterval on account of the overlying Black Reef formation, the evidence afforded by the two broad bands of quartzites next below the Government Reef, with their accompanying shales, is perfectly clear. The fact that these members can be followed with certainty from north to south across the farm, and that the Government Reef horizon maintains in the southern outcrop the strongly characteristic features which it shows elsewhere throughout the district, leaves no room for doubt as to the identity of the outcrop in question, while the continuity of the Main Reef Series on the east along a line parallel to that followed by the Government Reef cannot reasonably be questioned in the light of present mining developments. . . . ."

Correlation of Botha's and Main Reef Series.

The correlation of the Botha's Reef series with that of the Main Reef further to the east follows logically upon the tracing of the Jeppestown beds in the neighbourhood of Krugersdorp and upon other confirmatory evidence:—

"A similar curve to that shown by the Government Series in the neighbourhood of Krugersdorp, is followed by the Jeppestown Beds above them. This series attains a very great breadth of outcrop about the township of Krugersdorp, where the shales occupy extensive areas, the subordinate sandstones being much less in evidence. From the point where the series turns to the south it is covered by a broad sheet of Black Reef Quartzites associated probably with remnants of the Dolomite. Above the Jeppestown Series the beds of the Upper Witwatersrand System show a very similar disposition in concentric arrangement with those of the lower division of the system just described. The outcrop or sub-outcrop of the Main Reef Series is well known. Locally spoken of as the Botha's Reef Series, its correlation with the Main Reef Series of the Central Rand was for some time in doubt on account of the interruption of the actual continuity of outcrop by the Witpoortje Break. The similarity of the Botha's Reef Series to the Main Reef Series of the Central Rand, particularly to the nearest adjacent portions, as well as the close correspondence of the whole sequence of associated beds, leaves practically no room from a geological point of view for doubt as to the correlation of the two. Above the Main Reef Series the various other well-known horizons of the Upper Witwatersrand System, including the Bird and Kimberley Series of conglomerate beds, follow over the greater portions of their outcrops corresponding courses, the former being locally known as the Monarch and the latter as the Battery Reef Series. The Kimberley Shales, although, as on the Central Rand, never cropping out naturally at the surface, appear to be present at their proper horizon and are exposed in the neighbourhood of the dam situated immediately west of the middle point of the common boundary of Witpoortje and Luipaardsvlei, in which locality the Battery or Kimberley Series of reefs is much disturbed as it approaches the Witpoortje Fault, forming a crescentic outcrop, of which the southern extremity dips towards the northwest. . . . ."

THE POSITION OF THE CITY AND SUBURBAN.

Points from the Consulting Engineer's Report.

In the course of his annual report, Mr. Percy Cazalet, consulting engineer of the City and Suburban, writes:—The returns for the year under review have been most satisfactory. The tonnage milled shows an increase of 6,355 tons over the previous year, and while the costs are higher by 2s. per ton milled, the grade recovered (excluding accumulations) gives an increase of 7s. 0½d., or an improvement in profit on current working of 5s. 0½d. per ton. As a consequence of this increase, the profit declared—including accumulations £4,258 and gold reserve £26,412—at £276,593 shows an improvement of £104,106 over the year 1911, and is the best profit made by your Company since the recommencement of operations after the war. The development footage accomplished shows a decrease of 2,141 feet below 1911, but 505 feet of shaft sinking were done; development was interfered with by several causes, notably the non-completion of the second stage winder, a shortage of compressed air, and the increased difficulty experienced in ventilating the lower levels and sinking shaft. These difficulties have now almost entirely disappeared, as the ventilating fan erected on the 20th level has been at work since November; this is capable of passing 100,000 cubic feet per minute, and has already vastly improved the working conditions of the lower levels, including an appreciable reduction of temperature. The new 35 drill compressor has been at work since October, and has relieved the position considerably, admitting of more machines being put on to development. The second stage hoist is now erected, and only awaits minor adjustments to part of the electrical gear before being put to work. During the erection of the stage hoist it has been necessary to temporarily discontinue the sinking of the incline, but this should be recommenced within a few weeks. The ore reserves have been re-estimated as at 31st December, 1912, and amount to the following:—Leader, 518,900 tons, 9.4 dwts. value; south reef, 254,400 tons, 6.4 dwts. value. Total, 773,300 tons, 8.4 dwts. value. The estimated stoping widths of these are 50 inches for leader, and 62 inches for south reef, as compared with 47 inches and 57 inches respectively in 1911. The above tonnage, consisting wholly of block ground, can be segregated as under:—(a) Available for stoping, 529,500 tons valus, 9.0 dwts.; (b) ore exposed by driving which will be rendered available during current development operations, 148,100 tons value, 6.1 dwts.; (c) shaft pillars, 95,700 tons value, 8.4 dwts. Grand total, 773,300 tons value, 8.4 dwts. The present reserves are calculated on greater widths than in the previous year as the result of actual experience in the stopes of the lower levels of the mine. In addition to the foregoing reserves, there are considerable quantities of ore in the old workings consisting of main reef as well as leader and south reef, which are being drawn on currently and supply an appreciable portion of the ore going to the mill each month. The foregoing payable reserves, compared with those at the end of 1911, show a reduction of about 15,800 tons, but an increase of .8 dwts. in value; this decrease in tonnage, in view of the difficulties previously outlined, is negligible, while the improvement in value, due both to the higher values obtained in stoping as compared to those exposed while driving, and also to the increased proportion of the higher grade leader, is eminently satisfactory and promises a continuance of the greatly improved profits of the latter part of the year under review. The development of the lower levels on the leader continues to expose ore of very good grade, while some payable south reef has also been exposed on the lowest level where development work is progressing on this reef. The additions to the reduction plant have worked satisfactorily and have been responsible for the very substantial reduction of residues from an average value of .724 dwts. for 1911 to .397 dwts. in 1912, and .317 dwts. for the last three months of the year. The reduction costs were high during the earlier portion of the year while the plant was not yet working at its best, but have now come down to a more satisfactory figure, and especially so since the necessary electric power was supplied under contract from the Power Supply Co. Sands filling, which was undertaken with the object of rendering the main incline immune from crush, has been going on steadily for most of the year.

Wolhuter Gold Mines.

During the quarter ended January 31, 83,100 tons of ore were milled and 20,052 ozs. gold recovered. The revenue was £109,157 (26s. 3d. per ton), the working expenditure, £71,891 (17s. 3d. per ton), the profit £37,265 (8s. 11d. per ton), and the capital expenditure £6,793. The following is a statement of the ore developed or exposed during the quarter (includes ore mined from development):—Assumed payable tonnage: Deep level, 43,787 tons, assay value 5.80 dwts., over 50.7 ins.; east incline, 44,775 tons, assay value 6.80 dwts., over 52.4 ins.; mynpacht, 3,369 tons, assay value 5.74 dwts., over 40.0 ins.; total, 91,931 tons, assay value 6.29 dwts., over 51.0 ins. Assumed unpayable tonnage: Deep level, 1,212 tons, assay value 3.70 dwts., over 54.0 ins.; east incline, 5,419 tons, assay value 2.04 dwts., over 49.7 ins.; total, 6,691 tons, assay value 2.35 dwts., over 50.4 ins. The payable ore reserves are 829,706 tons, valued at 6.43 dwts. over 50.7 ins.

SOME FURTHER ASPECTS OF RAND MINING.

The Present Position and Its Causes—Some Remarkable Differences in Working Costs—A Lack of "Esprit de Corps" Along the Reef.

We return to a consideration of the present position of the mines, of mining, of the economics of the industry and of the future outlook on the Rand without any apologies, for although the subject is perpetually being talked of and written on, it is such a vast one that there is always something new to say, something new to write that has not yet appeared in print.

Five Years' Results.

In a recent issue we set forth in statistical form the experience of the past five years, from which the outstanding conclusion to be deduced was that whilst the tonnage milled had increased by 40 per cent. the gain in profit has been only 5 per cent. Despite the consummation of a number of large amalgamation schemes and the partial consummation of numerous other projects of this nature, working costs last year were 1s. 7d. per ton higher than in 1909. As compared with 1908, the grade of ore milled in 1912 was 2s. 5d. per ton less and the profit per ton was 3s. 5d. less. We have on numerous occasions endeavoured to demonstrate the salient reasons for this failure on the part of the mines adequately to respond to the new and what were generally anticipated as being more favourable conditions resulting from amalgamation and the great expansion of milling capacities. High recruiting fees, difficulties in connection with the change over from steam to electric power on the mines, and new expenditure as a consequence of legislation in connection with miners' phthisis have been some of the principal causes of a rise in operating expenditure. But we do not think that these altogether account for the advance in costs.

Futility of Close Comparisons.

Whilst readily admitting the impracticability of making close comparisons between different mines in regard to working costs, we think that in the cases of adjacent or neighbouring properties where conditions as to widths of reef mined, etc., are substantially the same, contrasts may be instituted which are productive of interesting data. We have before us the official figures of two properties on the Witwatersrand. They are under different control, but in regard to thickness of reef, etc., conditions in the two properties are substantially the same. Mine A is a deep level of mine B. The figures as to tonnage milled and working costs are:—Mine A.: Tons milled, 55,000; working costs per ton, 25s. 2d. Mine B.: Tons milled, 61,300; working costs per ton, 14s. 6d. The greater tonnage crushed by mine B is as nothing when the large difference in costs between the two properties is considered. So far as we know, no explanation of this striking disparity is to be sought in the direction of the relative amounts of development carried out at the two properties in question, for Mine B suffers from the disabilities attending deeper level working, whereas mine A includes a large portion of sub-outcrop area. It is also interesting to observe that the working costs per ton of one important mining group on the Rand are about equivalent to the recovery per ton of another large group, and a group which is, moreover, earning handsome profits.

Expenses and Profits.

These differences appear somewhat difficult of explanation. In a compact goldfield, remarkable for its uniformity both as regards the physical and chemical characteristics of the ore, and one in which the chief economic factors (in regard to the type and wages of labourers, etc.) are consistent throughout, it is remarkable that one group of mines should work for 25 per cent. less expenditure than another group. If lower working costs be accepted as synonomous with better efficiency, then it must be admitted that the case of the Rand is unique, for nowhere else in the world, we believe, can one find a huge industry in which the efficiency of one unit is 25 per cent. above that of another adjacent one. The question of whether the true objective of mine managers is not to be obscured and perhaps defeated by too strict attention to the maintenance of low costs naturally suggests itself in this connection. Low operating charges, we all know, are by no means necessarily synonymous with maximum profit. But in the instances cited in the foregoing we do not think that the lower range of working expenses has been secured at the sacrifice of dividends. It has been largely a counsel of necessity, and that the operating charges at other mines are so much above the average for the group mentioned above is, we think, a matter which calls for very full investigation. It is often alleged that selective mining is responsible for the greater costs of working at certain properties. The whole subject of selective mining is such a vast and complex one that we do not intend to do more than merely touch on it here. But at this point we might raise the query, "To what extent does selective mining really influence costs and does it tend to increase them to a very appreciable degree?" It is, as a matter of fact, quite conceivable that the richest stopes will often be the most accessible, and for ourselves we cannot see that selective mining should impose on the industry any greatly increased burden of expenditure.

Better Organisation Required.

Probably the root evil of the unsatisfactorily high rate of expenditure prevailing at many mines to-day is a general lack of *esprit de corps* along the Reef. In the case of a number of groups there is still a deplorable head office domination over mine managers. A lack of understanding between departmental heads, overlapping of duties and a general absence of organisation that commences with the humble hammer boy and extends upwards through all employees and departments to the high altar of technical control. Such a state of affairs is bound to have a woeful effect on underground work. A "boy" who has been ordered and harangued by miners, shift bosses and mine captain alike becomes bewildered as to who his master really is. A system which defines the spheres and functions of the head office officials as buffers between the manager and difficulty, which decrees that the manager shall be lord of his own domain, which allocates to departmental heads certain specified duties, and which makes for discipline and order amongst sub-heads and their departments obviously is to be desired. And it is to be feared that on the majority of Rand mines the lack of such a system rather than the possession and practice of it is conspicuous. Sweeping conclusions in connection with such an immense and intricate subject as that on which we have bestowed some attention in the foregoing should only be formed after full investigation and consideration, and we do not here intend to thrust any comprehensive indictment on our readers. At the same time we submit that the views contained in this article, emanating as they do from reliable authorities and most careful observation, are at the least worthy of consideration.

Diamond mining in German South-West Africa has since September last yielded much better results than in the preceding months of 1912, the monthly recovery having averaged over 100,000 carats. The improvement is, above all, due to the change in the diamond tax, which has induced several companies to resume operations interrupted as unprofitable under the old taxation. In the so-called North Fields on the Conception Bay, where formerly only very small stones (eight to nine to a carat) were found, a not inconsiderable number of quarter-carat diamonds and a few of more than one carat each have lately been mined.

ABOLITION OF SORTING ON THE RAND.

Inaccuracy of Waste Rejection Statistics—The Knights Deep Policy—Subject Receiving Full Consideration.

In a recent issue we dealt at some length with the abolition of sorting at the Knights Deep Mine. The decision of the Consolidated Gold Fields to do away with the rejection of waste rock and to put all the ore mined through the battery is a matter of very considerable interest, and some further consideration of the problem and of the issues involved should not here be amiss.

Mines Sorting Out Less than 5 per cent.

In accordance with this policy, the big Germiston mine hoisted 113,230 tons in January and milled 111,230 tons. It is interesting to note that the Consolidated Langlaagte in the same period rejected practically no waste rock, there being hoisted 44,933 tons and milled 44,510 tons, whilst the percentage of waste rock sorted out was only ·94. The Simmer and Jack sorted out 3·86 per cent., the Jumpers-cum-Treasury 1·73 per cent., the Jupiter 4·52 per cent., the Langlaagte Estate 4·93 per cent., and the New Primrose 4·23 per cent., the average for the whole Witwatersrand being 12·03 per cent. The Chamber of Mines statistics show a steady tendency towards decline in regard to the percentage of waste rock rejected. Thus in 1908, 15½ per cent. is recorded as having been thrown out. Next year the percentage was 14·45; in 1910 it was 13·64; in 1911 just over 13, and last year 12·57. Some measure of importance attaches to these figure, but it is probable that they only reflect the position in regard to the elimination of waste rock in a very approximate degree.

Accurate Figures Impossible.

To make the point clearer, we will assume that a mine is recorded to have raised 50,000 tons of ore in a given month and to have sorted out 10 per cent., leaving 45,000 tons milled. It would from this be generally understood that at the property in question 45,000 tons of ore were milled and 5,000 tons of barren rock were sent to the waste dump. As a matter of fact, nothing of the kind takes place. Generally speaking, much of the 5,000 tons sorted out contains good gold values, and a great deal of the 45,000 tons stamped will, in an ordinary mine, contain barren rock. A good deal of the ore broken consists of unsortable "fines." Rock of this nature may be of distinct payable value, or it may be wholly worthless. A certain amount of automatic elimination is bound to take place in every mine in regard to "fines." The finely broken material may adhere to the sides of trucks, or skips, or it may remain in the mill bin. Then, again, it should be remembered that the human element enters into this question of the rejection of waste rock to a very material degree. A piece of rock going over the crushing belts may have been broken on a foot or hanging wall contact. Perhaps it is half ore and half waste. It is just at a contact that best values are often obtained, and the apparent waste portion of the piece of rock in question may contain higher values than the pebble section. This piece of ore may go to the waste dump, or it may pass into the mill bins. Obviously it is impossible, or at the least impracticable, closely to control the elimination of all unpayable rock, and to crush only payable ore, and for this reason, the percentages stated in the Chamber of Mines analysis sheets and in the reports of the different companies must only be regarded as being approximately correct.

Subject Receiving Thorough Attention.

There is material evidence of the fact that the whole question of sorting is now receiving more thorough consideration by consulting engineers, managers and metallurgists than at any other time in the history of the industry. The outstanding economic feature in regard to certain comparatively low grade mines crushing a large tonnage each month is that "waste" can be crushed for considerably less than the expense entailed in rejecting this ore on picking belts. The average value of the Knights Deep sorted waste was about 1 dwt., and the maximum recovery obtained from this waste rock may be placed at ·7 dwt. Were the mine a high grade proposition, it would not pay to burden the mill with ore going under half-a-crown per ton, but at a mine like the Knights Deep, with a 4 dwt. recovery and a plant of over 100,000 tons per month capacity, it is not difficult to understand that the sorting out of waste may be an unprofitable operation. Doubtless there are numerous mines on the Witwatesrsrand in addition to the Knights Deep which would find it profitable to dispense with waste rejection plants altogether. We understand that the matter is being given very careful consideration, and a further reduction in the percentage of waste rock sorted out each month seems probable.

Zaaiplaats Tin.

The following at the results from the Zaaiplaats Tin Mining Company's property for the month of February:—Days run, 27·6; ore milled, 2,867 short tons; residues re-treated, 600 short tons; concentrates won, 95 long tons; average value of concentrates, 70·6 per cent. metallic tin; estimated profit for the month, excluding Government tax on profits, £7,405 15s. 3d.; add adjustments in respect of estimated values of previous shipments, £139 1s. 5d.; profit declared for the month, £7,511 16s. 8d.; capital expenditure, £251 10s. 9d.

The report for the last six months of the directors of the Zaaiplaats Tin Mining Company, Ltd., states that 15 stamps ran 121·64 days, crushing 13,430 short tons of ore, the duty per stamp per day being 7·36 short tons. In addition, 1,544 short tons of accumulated residues were re-treated. The output for the six months amounted to 405 long tons of concentrates, equivalent to 280·48 long tons of metal. The reduced production was due partly to a falling off in grade, but chiefly to a shortage of water caused through a very severe drought and the consequent failing of the Sterk River, from which source the supply is obtained. The estimated profit for the half-year amounted to £25,061 10s. 7d., made up as follows: Estimated profit for the six months' operations, £26,334 19s. 4d.; net adjustments of estimated values of shipments to October 31, 1912, £1,273 8s. 9d.; profit declared for the half-year, £25,061 10s. 7d. The expenditure on account of capital for the half-year was as follows: Machinery and plant, etc., £8,798 9s. 8d.; mine development and reserve dump, £2,134 8s. 10d.; total, £10,932 18s. 6d. No dividends have been paid for the period covered by the report. The profits have been devoted to liquidating the liability which was incurred for the erection of plant and other capital expenditure. It is anticipated that this will be paid off by March 31 next. An ample supply of native labour has been available, the complement for the six months averaging 800.

Transvaal G.M. Estates.

A dividend of 20 per cent. (4s. per share) has been declared by the board of the Transvaal Gold Mining Estates, Ltd., payable to all shareholders registered in the books of the company on Monday, March 31, and to holders of coupon No. 14, attached to share warrants to bearer.

PROSPECTS OF CINDERELLA CONSOLIDATED.

The Question of Suspending Crushing—Central Shaft Expected to Cut Reef Before End of Year.

Ill-fortune seems to have dogged the steps of the Cinderella Consolidated right from the commencement of crushing operations, and it can scarcely come as a surprise to those who have studied the recent returns of this mine to learn that the directors have given the question of temporarily suspending milling operations earnest consideration.

Last Month's Poor Returns.

Last month the company operated eighty stamps and three tube mills, and crushed 17,440 tons for a total recovery of £23,101. Working costs were at the rate of 27s. 4d. per ton, and absorbed £23,826, so that the month's operations resulted in a loss of £725. In January, 13,390 tons were milled; working expenses were at the rate of 25s. 4d., and a profit of £1,022 was earned; whilst in the last quarter of of 1912 working expenditure amounted to 24s. 9d. per ton and a profit of £8,976, equal to 3s. 2·7d. per ton, was won. In connection with the high costs prevailing at present, it should be borne in mind that as from January 1st last the development redemption charge was increased from 2s. to 3s. per ton. It will be fresh in the minds of readers that a change in management recently was effected at the property, Mr. H. G. Nitch, of the Meyer and Charlton, relieving Mr. Girdler-Brown, who has assumed the reins of office at the " town " mine of the group. Changes in management inevitably and unavoidably result in a certain amount of dislocation, and it appears that the transfer had a marked effect on the Cinderella, a property which on account of the peculiar conditions prevailing there, is particularly sensitive to ill-effects from a change in administration at the mine. This, combined with a short month and the recent increase in the development redemption charges, resulted in the unsatisfactory result recorded above.

Is it Policy to Cease Milling?

A state of affairs, such as that disclosed in the report for last month, cannot be expected to continue for an indefinite period, and, unless reductions can be effected in working costs, there would seem to be no object in keeping the mill running during the time that the mine is working under its present disadvantageous conditions. The grade crushed last month, although certainly not high, was sufficient for a mine working under more ordinary conditions to earn profits. Admittedly there is plenty of room for economy in the Cinderella's costs, but under the present cramped conditions of working it will be very difficult to introduce any substantial money-saving reforms. This month, on account of longer running time, and since the employees should by now have settled down to the new conditions brought about by the change in management, the company should be able to make a better showing; but until the new central shaft is in full working order and connection between this shaft and the Cinderella shaft has been effected, the mine will be working under severe disadvantages, and it must be a very moot point whether it would not pay the company to forego such small profits as the company can under present conditions hope to earn and hang up stamps.

Development Satisfactory.

Readjustments, which will reduce the cost of working much below the present level, may be practicable, but the most encouraging feature in connection with the Cinderella is undoubtedly the manner in which the mine is opening up. We understand that values in depth are good, and that the directors are well satisfied with the way in which the mine is developing generally. It is hoped that the new central shaft will reach the reef before the end of the year, and that connection between the two shafts will be effected in approximately eighteen months' time.

A New Epoch.

When this shaft strikes the reef the beginning of a new and important epoch in the history of the Cinderella Consolidated will commence. So far the property has had to be operated on a very cramped basis, and intersection of reef in the central section will be the preliminary signal for a policy of much more vigorous development than has so far been possible, followed at a later date by a substantial increase in the reduction and treatment plants. The difficulties encountered by the company, although they have resulted in disappointing returns, are, it is hardly necessary to state, merely of a temporary nature. In a few months' time development will be proceeding from the new shaft, and throughout the underground workings more favourable conditions will obtain. The intrinsic value and great potentiality of this mine remain unaffected by the troubles of the past few months, and the day is not now far distant when the directors will be enabled to proceed with the development of this 2,100 claim property on lines which, for a variety of reasons, have so far been denied to them.

Modderfontein B.

The report for the three months ended the 31st of December of the Modderfontein B embraces the financial position of the company as at the 31st of December, as reflected in the interim balance sheet, working expenditure and revenue account for the quarter, and appropriation account (subject to audit), also particulars of the quarter's development, reduction operations, etc. The interim (abridged) balance sheet on the credit side shows sundry assets: Shares, stores, livestock, furniture, sundry debtors and payments in advance, etc., £39,489; Rand Mines Power Supply Co., compressor plant, £25,451; and cash at bankers and value of gold in transit, £293,760. The liabilities are sundry creditors on account of dividends, stores, wages, Government tax, etc., £197,879, and the balance brought from appropriation account is £209,327. Working revenue and expenditure account, received from gold realised £172,642, or 34s. 6d. per ton milled. Working expenditure absorbed £82,146, or 16s. 5d. per ton, which left a working profit of £90,496, or 18s. 1d. per ton. Sundry revenue brought in £3,057, and there is a debit charge of £999 on account of the Miners' Phthisis Act Compensation Fund Assessment. The balance of working expenditure and revenue account for the previous nine months was £293,389, and for the December quarter £92,554, making together a total of £385,943. The charges against this sum are Government tax (estimated) for twelve months £36,383, French fiscal taxes, £233; dividend declared in December, £140,000, and the balance, £209,372, is carried to the balance sheet as stated above. The credit balance of appropriation account is wholly available for distribution. The amount of liability at the commencement of the financial year (£74,611), less the credit on capital expenditure for the year ended the 31st of December (£3,551) has not yet been appropriated. The final credit balance will not be determined until the balance sheet and accounts as at the 31st of December have been prepared and audited. On development work 3,441 feet were driven, sunk, and risen, exclusive of stopes. The reef disclosures were as follows:—Main Reef—Distance exposed, 2,145ft.; width, 16in.; assay value, 80s. 7d. The reduction work crushed and treated 100,000 tons. The value of ore before crushing (as reflected by mill yield and value of pulp) was 36s. 4d. The total yield was 41,066 ozs., and the total yield per ton 34s. 6d. During the quarter 100,000 tons were milled, a decrease of 370 tons on the September quarter, but owing to the mine grade being gradually reduced the yield decreased 2s. 11d. to 34s. 6d. per ton. Working costs show an improvement of 10d. per ton, and now stand at 16s. 5d. An increase of 143 feet in development resulted in 3,444 feet being risen, driven and sunk, of which 2,143 feet were on reef, the values exposed averaging 80s. 7d. over 16 inches. No estimate is given of the payable tonnage developed for the half-year, as the annual report, to be issued in April, will state this information for the whole year, together with particulars of the ore reserves on hand. Mining and reduction operations proceeded smoothly during the quarter. There is a credit on capital account for the quarter of £24,485, made up as follows:—Cost of air compressor plant charged to Rand Mines Power Supply Company, in terms of agreement, £26,348; less capital expenditure for quarter, £1,863, leaving a credit of £24,485. A sum of £10,950 has yet to be provided for the completion of authorised work,

MINING MEN AND MATTERS.

Mr. Sussman, head of the German Steel Trust, is on a visit to the Rand.

* * * *

The resignation, through ill-health, of Mr. John Cowie, the able and popular Secretary of the Chamber of Mines, is announced. Tributes were paid to his long and faithful services at the meeting of the Chamber this week.

* * * *

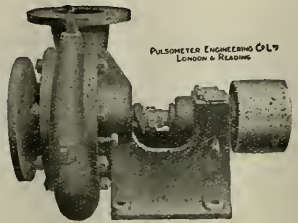
Mr. J. Celliers, formerly manager of the Robinson Deep and Sub-Nigel, has been appointed Professor of Mining at the South African School of Mines. Mr. Celliers is one of the most brilliant graduates of the school, and has had a distinguished career.

* * * *

The following changes in representation on the Chamber of Mines have taken place:—The Consolidated Mines Selection Co., Ltd.: Mr. W. L. Honnold, *vice* Mr. A. S. Pearse. The New Era Consolidated, Ltd.: Mr. H. S. Johnson Hall, *vice* Mr. H. T. Elliott. Brakpan Mines, Ltd.: Mr. A. S. Pearse (as the second representative of the company). East Rand Proprietary Mines, Ltd.: Mr. J. D. H. Lang (as the fifth representative of the company). The Luipaardsvlei Estate and G.M. Co., Ltd.: Mr. H. W. Anderson, *vice* Mr. W. P. Taylor. The Langlaagte Estate and G.M. Co., Ltd.: Mr. J. H. Crosby, *vice* Sir J. W. S. Langerman. Rand Klip, Ltd.: Mr. E. H. Read, *vice* Mr. G. R. Airth.

An arrangement has been made between the Government and the Chamber of Mines, and embodied in a Memorandum, whereby a uniform method of treating "excess development" in the accounts of mining companies has been arrived at.

CENTRIFUGAL PUMPS



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THE YEAR WITH THE ANGLO-FRENCH (TRANSVAAL) NAVIGATION COAL ESTATES.

Increased Profits—Better Conditions of Mining.

In 1912 the net profit on coal winning of the Anglo-French (Transvaal) Navigation Coal Estates, Ltd., was £14,689, representing an increase of £4,706 on the profit for 1911, due to increased tonnage, improved quality, and better conditions of mining. A further £3,000 has been allocated, in terms of the company's articles of association, for extension of plant, depreciation, etc., and two interim dividends, Nos. 3 and 4, of 3¾ per cent. and 6¼ per cent. respectively, have been declared, payable to holders of preference shares. These dividends absorbed £12,000, and, after making allowance for £1,864 brought forward from the previous year, there remained an amount of £1,553 to be carried forward. The contingent liability in respect of the cumulative preference dividend stood at the end of the year at £31,030, or £3,600 less than the previous year's figure. The agreement entered into with the Apex Mines, Ltd., on the 15th January, 1908, is still in force. Under this agreement the Apex Mines, Ltd., holds the right and option to acquire the lease held by the company over the coal rights of the farm Groenfontein No. 159, situated in the Middelburg district, and in the event of the Apex Mines, Ltd., exercising its option and selling the lease, then the company will participate in the net profits made by the Apex Mines, Ltd., in connection with such sale. The company, in conjunction with the other members of the Transvaal Coal Owners' Association, has entered into a fresh agreement with that association for a further period of five years from the 1st of July next.

The Consulting Engineer (Mr. E. J. Way) in his report states:—I have carefully perused the report submitted by your General Manager, Mr. J. R. Thom, on the operations during the year ended 31st December, 1912, and confirm the statements made therein. During the year the change over from the "Upper Seam" to the "Lower Seam," referred to in my report for 1911, has been completed, and since the middle of the year all the output has been obtained from the latter seam. Development on the Lower Seam has shown that it is maintaining its high calorific value and freedom from waste. The "rolls" which caused so much trouble in the Upper Seam workings are fortunately only developed to a slight extent in the Lower Seam. In general, I consider that the development has been very satisfactory. The average monthly output for 1912 amounted to 21,889 tons, as against 19,141 tons per month for 1911. The whole of the surface and underground equipment of your mine has been well maintained.

Mr. J. R. Thom, the General Manager, writes, *inter alia*:—The result of the year's work shows an improvement on the previous year both as to output and profits, although the latter might have been more had it not been for the large amount of dead work necessary to the opening out and developing of the Lower Seam. Since the middle of the year all the output has been coming from this seam, and I am pleased to state that the seam is maintaining its high calorific value throughout, the amount of sorting being practically nil, and it has a good workable thickness. Should present conditions continue—I have every confidence they will—working costs should be further reduced throughout this year. The total output for the year 1912 was 262,666 tons, as against 229,622 tons for the year 1911.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Air Pressures on the Rand.

To the Editor, *South African Mining Journal.*

Sir,—Your article, "Air Pressures in Witwatersrand Mines," might well be commended to mine managers and mine captains, as well as consulting engineers. I am pleased you make mention of pressure as high as 100 lbs. I can see in imagination some mine managers reaching for a good strong stimulant on reading that. For many have got the idea that 70 to 80 lbs. pressure in the engine-room, with 60 to 65 lbs. at the machine drill, is ample. Do they realise what that 20 per cent. loss in transmission means in coal alone? How many types of rock drills have been discarded or received a bad name, how many miners have got the sack, or get the sack, each month through indifferent air pressure? Poor air pressure with certain machines means continual trouble. The blow is not strong enough to give the necessary clearance to the jumper; it jambs; the jumper is in use twice as long as it ought to be, gets blunt on its edge and battered out of recognition, and narrows the hole to such an extent that there is difficulty in getting the next drill to follow on, and in many cases ends in the hole having to be abandoned. I have known to be used as many as 17 jumpers in drilling three holes of 3 feet each, which I set down wholly to this cause—low air pressure. I hazard the statement that with certain machines there is a saving in actual drilling time of from 20 to 40 per cent., when working at 75 lbs. air pressure as against 60 lbs. This means much to the miner and to the manager, for in a sense it means an increase in the output of the compressor by this amount. Also that there would be a saving in steel, and the number of drills to be sharpened. Except for the fact that there are so many types of rock drills in use, that one mine may have harder rock than another, it would be valuable to compare the number of drills sharpened per 100 feet drilled, and the consumption of steel, on mines using first-class air pressure with those on mines using poor air pressure. Much useful information might be gained by calling for correspondence on this important question—rock drill failure.—Yours, etc.,

W. F. B.

[Further correspondence on the subject would certainly be welcome.—Ed., *S.A.M.J.*]

The Inefficiency of White Labour on the Mines.

To the Editor, *South African Mining Journal.*

Sir,— The interesting contribution to your esteemed journal of the 15th inst. by Mr. M. Roach on the subject of decreasing efficient white labour on the mines intensifies the existence of the puzzle obtaining just now, and that is "why are there so many able, capable and experienced men refused employment when they apply for the same"? I know of many cases where such as these have gone from one end of the Reef to the other month after month, only to meet with the curt and often discourteous reply of "No vacancies." Indeed, on approaching many a mine, one is confronted with a notice-board stating, in glaring letters, such to be the case. In the case of men a bit advanced in years, men who have devoted their energies in the prime of life to discovering new fields, opening up and helping to develop the same, there is as little hope of obtaining employment as there is of a camel getting through the eye of a needle. The utter feeling of despair suffered by such baffles description. For the average clerk, bookkeeper, or such as have had a commercial or mercantile training, some work or other can generally be found in the city; but what hope has the man who has spent his life on the veld or "down below" confined to this narrow groove, in the struggle for existence, unless he gets it from the source in question? As one who has dealt with the mining industry nearly all his life, and has had to face the great economical side of the same, I consider the employment and training of youths and young men a step in the right direction (although it is certain that it leaves many of them physical wrecks at a very early age), still it should not be to the entire exclusion of those who have helped to build up the industry, especially in cases where they are physically fit, and quite able to hold their own with their younger brethren, besides having the advantages of experience. I wish some abler pen than mine could be wielded to bring the matter to the notice of the mining magnates, many of whom are rolling in wealth and can indulge in every form of luxury, while their less fortunate fellow-creatures are suffering from the want of necessities—and, what is worse, seeing those dependent on them do the same. At the very best the life of a miner is a wretched one. For nine hours a day he gropes about dangerous places in darkness and often in a fœtid atmosphere charged with germs containing the most deadly diseases. He is face to face all the time with the possibilities of a violent and painful death, and, what is worse still, some accident that might unfit him for future work, or perhaps render him an unsightly cripple for the rest of his life. There is no security of tenure—the worst feature of the whole case—incurring the displeasure of the shift boss, the infringement of one of the numerous mining laws, however unintentionally made, lays him open to instant dismissal, accompanied, perhaps, with a heavy fine. But even where he retains his job, when the signs of advancing years begin to betray themselves, he is discharged, unprovided for, unpensioned, contemplating a despairing and hopeless future. How different from the lot of the Civil Servant, for instance, who very often after a few years of, comparatively speaking, a life of luxury and ease, complacent in the security of his position, is retired with enough to keep him in comfort at any rate. When one considers that the prosperity of South Africa hinges almost entirely on the mines, and that without them it would be a very poor South Africa indeed, some changes for the betterment of the men who work the same, at the terrible risks abovementioned, should be made; and I say that it is a glaring shame and scandal that those who pioneered these fields should be thrown aside and prevented from working when they are able and willing to do so. There is another point pertaining to these where an exception to the prevailing law in respect to mining examinations could be made. The writer, who has discovered and opened up many and many a proposition, but generally a long distance from the Rand, has been debarred from entering for the mine managers' or mine captains' examination; and, though willing to do so, and confident of effecting a pass, the age limit again crops up, as none can compete who are over 50 years of age. Trusting that this will lend itself to your favourable consideration.—Yours, etc.,

"PIONEER."

The White Labour Supply.

To the Editor, *South African Mining Journal.*

Sir,—I do not for one moment agree with the somewhat pessimistic view as taken by your correspondent, Mr. Roach, who writes under the above heading in your issue March 15. Even supposing that every Cornishman on the Reef was to clear out to-morrow, there would be very possibly better men in a very short space of time to fill their places. No man's place in this world that cannot be filled! It would be rather interesting if Mr. Roach or some other of your many intellectual mining readers would state exactly what are the scientific and technical features attached to the work of a miner underground to-day. As to any physical ability being necessary, nothing exists to-day underground in the shape of work that a miner does to call for physical skill, strength or endurance; in fact, to ask a miner who has worked underground for two years to drive a machine, he would at once reply, "What do I pay boys for?" He simply directs or marks the "face" as to where he thinks the holes ought to be drilled, the machine and the nigger does the rest; the so-called miner retires and sits or sleeps on his box. As to any special knowledge as to where the reef runs or in what direction it takes, nature here beats him, as also his mine captains, managers, and shift bosses. Turning to the question of wages as earned by miners and mine employees, it would be interesting to know how many men now working on the mines on the Rand, and who may have come out from Cornwall, where they worked as miners, ever earned in Cornwall £2 10s. per week, and this where they had to do the work that they now pay Kaffirs to do? The majority of them possibly worked for 30s. per week, and these men now earn anything from £30 to £100 per month for doing the charging up and blasting! Your correspondent states that the place of the Cornishman cannot be adequately filled by the cheap, unskilled labour from Southern Europe! It does not need to go to Southern Europe to find men who would become very possibly far more capable and intelligent miners than come from Cornwall, as at the moment in England, Ireland and Scotland and Wales there can be had a million white men, capable to become skilled miners, as we to-day in the Transvaal know it; and, what is more to the point, men who, if they only had the offer put to them, and under conditions of far less pay than is to-day paid to miners on the Rand. One hears as to the cost of living being five times what it is in the Old Country! Will any miner now on the Rand state that he can get as good a meal at one shilling in London, or any other part of the United Kingdom, as he can to-day in a Johannesburg restaurant? Let him send Home a Johannesburg menu, then he would find that instead of "going through" the menu at Home, he would possibly be charged for the extras, and instead of a shilling meal, he would finish up at *One Shilling and Ninepence*; and then we may also refer to the marvellous sixpenny meal to be obtained in Johannesburg. How many miners that come out from Home ever threw their dinners of roast beef, vegetables and potatoes, as also Yorkshire pudding, out of their boarding-house window as not being good enough for them? It has been done at mine boarding-houses on the Rand; and better food no man could ask for. One hears a great deal as to the conditions of work on the mines and the great cost of living, outside the question of rent, where we find the mines charge an unmarried man some 10s. per month, for what to-day on many of the mines consist of a room not fit for a dog kennel; married quarters at £4 per month. In the outskirts of London, say, Forestgate, a man can get a nice house for 3s. per week, including a bathroom. This point only, namely rent, is the excessive feature of living, added to which whisky at 1s. per glass and beer at sixpence. If the actual cost of the latter items per man are taken for the quantity consumed per month and deducted from the cost of living, the net cost of the upkeep of a miner would come out at a price quite commensurate with a far less wage than he now is paid on the Rand. The white labour question at the moment is very prominently before us, and the greatest "Dullards" to grasp the significance and importance of the employment of all white labour on the mines are the directors of the mining companies, and the actual reason being that none of them have ever been through the curriculum of mine work underground, and, in fact, the majority know nothing whatever about it. To cut matters short, given all white labour to work all the mines on the Rand intelligently will mean an all-round reduction of working costs to all mines of some twenty-five per cent. It must be borne in mind that £30 per month or £5 per week wages to a strong, healthy, unskilled labourer from the Old Country means an enormous wage. The very best skilled miners in the North of England do not earn any such money; week for week for the whole year, possibly £2 10s. per week is the average; and yet one hears the question raised that white labour, imported or otherwise, cannot be economically used as against black labour on the mines. It must be borne in mind that when the average white man is at work, not alone are his muscles and skill at work, but also he uses his brains. Supposing that instead of natives doing the work of the mines all white labour is employed, it does not require five or six niggers to work two machines. Two intelligent white men will do it; thus do you get the work done *at less* cost and less loss of life than at present exists, as these men are on their own and are paid per fathom. If intelligent white men are employed all round on the mines, underground and on the surface, the practical distribution of brain power, skill and assiduity, backed by the common law of self-preservation, which latter means that with all white men underground, the accident average must become very materially reduced, inasmuch as the thousands of natives killed annually would not occur. Besides these items of economic saving, everything connected with the mines would mean greater skill and economy of tools and machinery. Natives care nothing as to the question of economy when it comes to the use of mining materials; white men must when they are held responsible. With an all white labour work on the mines, it most assuredly must lead to a reduction of such figure-heads and their salaries as now exist in the shape of mine managers, engineers, surveyors, shift bosses and mine captains, as with men who are working underground and who are virtually responsible for their own work as well as being responsible for the lives of their white comrades, they cannot, as now, lay blame on the boys; besides which the present rambling about from mine to mine must cease, as the question of so many white men being employed as miners and mine employees creates a competition that stops men giving up their jobs. With such a bringing about of white labour the whole community must benefit, and none will derive a greater benefit than will the shareholders. The howling as to the danger of white labour being introduced on the mines, inasmuch as that under the conditions of life on the Rand, the wages as then earned by white men, could not maintain a decent livelihood, a man single to-day can live comfortably on the Rand at £2 per week, viz., 21s. per week for his board, and 5s. per week for his lodging, leaving him 16s. over. If he drinks beer at 6d. per glass, and whisky at 1s. per glass, he cannot come in at £2 per week. It would be interesting to know where £70 or £80 per month is earned by a mine captain, and £35 to £40 per month by shift bosses, to say nothing of engineers at £80 to £100 per month, and intelligent managers at £2,000 to £2,500 per annum! The sooner that shareholders and their directors take into their serious consideration the question of the all adoption of white labour on the mines the better for themselves and South Africa. The "bar"' at present to any great number of white unskilled labour coming to South Africa stands thus: The land is virtually idle, viz., there is no such thing in South Africa as intelligent active agriculture; hundreds of millions of acres of the finest soil in the world lying untouched. The great mining industry encourages black labour as against white. The handwriting on the wall denotes white labour as the future salvation and regeneration of the mining industry and of South Africa.—Yours, etc.,

"AN UNDERGROUND WORKER."

New Heriot G.M. Co.

Mr. B. Madew, consulting engineer of the New Heriot, writes as follows:—The operations of your company for the period under review resulted in a profit from current ore treatment of £104,287, and £6,463 from the treatment of accumulations, making a total of £110,750. In addition to the percentage sorted on the surface, a considerable amount of waste is utilised in the workings for the building of packs, this elimination of unprofitable rock accounting for a good deal of underground sorting. Thus, while the surface sorting at 15.1 per cent. represents a decrease of 4.5 per cent., the amount discarded underground was 7.3 per cent., as compared with 5.1 per cent. for the previous year. The tonnage milled shows a reduction of 7,013 tons, but, chiefly owing to the higher grade of ore mined, the yield represents an increase of 2s. 6.9d. per ton. Included in the yield and profits is the gold reserve fund carried over from last year, amounting to £4,731, which, over the tonnage milled for the year, is equivalent to 8d. per ton. The improved yield, however, was considerably counteracted by an increase in the working costs of 1s. 6.5d., so that the profit per ton reveals an increase of a little over 1s. as compared with that won during the previous twelve months. The development footage accomplished was 3,898 feet, as against 4,322 feet for last year. The ore developed amounted to 122,723 tons, of which 109,822 tons, or 89.5 per cent., were payable; having an average value of 7.9 dwts. per ton. The payable ore reserve at 31st December, 1912, was estimated as follows:—North Reef, 11,025 tons, value 11.0 dwts., stoping width 59 inches; Main Reef, 97,984 tons, value 6.9 dwts., stoping width 89 inches; Main Reef Leader, 278,926 tons, value 8.6 dwts., stoping width 41 inches; South Reef, 202,807 tons, value 7.9 dwts., stoping width 48 inches; total and average, 590,742 tons, value 8.1 dwts. Compared with last year, there is an increase of 21,000 tons, while the grade reveals a reduction of 0.3 dwts. per ton. The unpayable tonnage developed in the mine is estimated to be 205,949 tons, having an average value of 3.1 dwts. This tonnage represents the accumulated unpayable ore in the mine. Every effort is being made to supply the mill to its full capacity, so as to reduce working costs, and, given sufficient labour, there is every prospect of succeeding in this direction.

Discoverer's Rights.

Applications have been made by the undermentioned to be regarded as discoverers of gold in the mining district of Heidelberg:—John Joseph Atmore, sen., 29 Long Street, Germiston, and Edwin Charles Burton, P.O. Box 221, Johannesburg; locality, Bongaspoort No. 26; farm owner, J. W. Spies.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings; Box 2061.

Rhodesian Section.

LATEST MINING NEWS.

Lonely Ore Reserves—Tributing the Selukwe—Rhodesia Copper—Refractory Ore at the Gaika—Hartley Activities—The Great Dyke and its Minerals—Flotation of the Seigneury.

The report of the consulting engineer to the Lonely Reef G.M. Company, for the quarter ended December last, was published by the directors in mail week. It appears that 949 feet of development was done during the quarter. The ore reserves now stand at 174,529 tons, of the average value of 1 oz. 2·4 dwts. per ton. At the end of October the reserves stood at 160,410 tons, the average value being 1 oz. 2·7 dwts. A year ago the respective figures were 140,344 tons and 1 oz. 2·6 dwts.

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It may be recalled that after the technical advisers had recommended that the Selukwe Mine be tributed, the shareholders decided, on a poll being taken, to continue working on the company's account. No success being achieved, the mine had to be let on tribute, and in November, 1911, the Tebekwe Syndicate took the property in hand. The syndicate has expended a good deal of money, and the fact that a two years' agreement has now been arranged indicates that they think well of future chances.

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The secretary of the Rhodesia Copper and General Exploration and Finance Company, Ltd., issued a circular in mail week to the holders of options on shares, stating that the directors have had under consideration representations made for an extension of the options on shares of the company at par, which expire on February 28. "It has been decided that any option holder who takes up one-tenth of the shares represented by the present registered option certificate on or before February 27 shall retain an option on the remaining nine-tenths of such shares to December 31, 1913."

* * * *

Refractory ore is being met with on the Gaika Mine, and for this reason only a small quantity of gold, comparatively, was recovered by the cyanide process during January —150 ounces. The management are now taking measures to overcome this difficulty, having commissioned Mr. H. T. Brett, metallurgist, to investigate into and report on the matter, and they hope to have the percentage of extraction substantially increased in the course of a month or so. It is officially announced that the profit on the working of the mine during January amounted to £644.

* * * *

In the Hartley district there has lately been more life than has been seen for some time. Mr. Tavener has taken over the Togo Mine, and Messrs. Milne and Joslin have acquired the Iron Mask. On the other hand, Mr. F. Walsh has disposed of all his mining properties, and is leaving the district for Portuguese East Africa. The Heroine Gold Mining Co., Ltd., have placed an order with Messrs. Fraser and Chalmers for a 10-stamp mill (1,230 lbs.), to be added to the 2-stamp mill at present running on their property at Umsweswe, and, when the new plant is completed, as it probably will be in about three months' time, the company hope to be able to crush from 2,000 to 3,000 tons per month. The Amarosa began crushing last week. At the Cam and Motor there is also considerably activity, and on Wednesday a large consignment of roasting plant arrived at the mine. The light railway which the company are constructing for riding wood is also strongly in evidence.

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Mr. F. P. Mennell, continuing his interesting "Practical Notes on Some Rhodesian Ore Deposits," writes in the current issue of the *Rhodesian Mining Review* on "The Minerals of the Great Dyke." In the course of this he remarks:—"What is in many respects the most striking geological feature of the country, and in all probability the most remarkable known development of basic igneous rocks, is the great intrusion about four miles wide which runs in a nearly straight line through the middle of Rhodesia for about 250 miles. In places it consists of a kind of gabbro free from olivine, but containing more or less enstatite. This is well seen at Selukwe and where the Salisbury railway crosses it, as well as on the Salisbury-Hartley road. Even better known is the very conspicuous dark-green, coarsely crystalline type of rock made up of enstatite with little or no felspar, which can scarcely fail to attract the attention of anyone travelling on the Lomagundi railway or on the roads from Balla Balla or Insiza to Belingwe. For some years past I have been in the habit of labelling specimens from this remarkable belt of rocks as from the 'Great Intrusion,' and I notice the Geological Survey have adopted what is perhaps a better variant of this term in the 'Great Dyke,' which, as it has thus been given publicity, is here accepted. Associated with the more normal rocks of the Great Dyke are many dolerite dykes; for instance, on the Hartley-Salisbury road and in the Umvukwe Hills. Often, too, the rocks are altered into serpentine, sometimes over large areas, as near Lalapansi and in many parts of the Umvukwe Hills. It is these serpentinised areas which are most often mineralised, and they are therefore of special interest from our present point of view. Now it certainly cannot be denied that most of the more accessible spots where occurrences of potentially valuable minerals are to be found, appear to offer small prospects of profitable working on more than a very small scale. Perhaps this does not suggest a very cheerful outlook for the would-be prospector, but it need hardly be said that I have no very minute acquaintance with more than a few out of the thousand square miles which await prospecting. There are many tales of mysterious old workings in various parts, from some of which I have seen specimens which certainly shed no light on their hidden secrets, besides which the majority of the minerals to be expected are very unlikely to have received attention from 'ancients' or natives. They are largely, moreover, of a nature to attract little notice even from the modern prospector, comprising, as they do, several of the least known, though by no means least valuable of the commercially prized mineral products. The following is a fairly comprehensive, but not perhaps exhaustive list:—*Metallic:* Chromite, cobalt, copper, manganese, nickel, platinum. *Non-metallic:* Asbestos, corundum (including sapphire), magnesite, talc."

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As a result of a somewhat prolonged visit to Johannesburg, Mr. N. A. Arnold has succeeded in arranging the flotation of the Seignury Mine, and on Thursday week, the prospectus of the company, registered under the name of the Seignury Gold Mining and Development Company, with a capital of £20,000 in £1 shares, made its appearance. The vendors take 8,000 shares credit as fully paid, and £7,000 in cash; the balance of 5,000 shares being allocated for working capital. Accordingly 12,000 shares are offered for public subscription, the whole of which it is believed—though no definite statement to that effect has been made—has been guaranteed in Johannesburg. The mine is situate near the Pickstone and Concession Hill properties, and about 16 miles from Hartley station. The purchase includes 30 claims, together with a quantity of machinery and buildings, the estimated value of which is some £4,000. Ten additional claims, about a mile and a half north-west of the Seignury Mine, and known as the Kirkstall block, are also included in the purchase. The Seignury has been crushing continuously for nearly twelve months, and some 3,000 tons of development rock have yielded, it is said, an average of 24s. per ton from milling only. In November last a cyanide plant was installed, and in December an average of 37s. 6d. (9 dwts.) was recovered from 420 tons milled and cyanided. Working costs are stated to be under 14s. per ton. The reef averages 5 feet in width, and three levels have been driven—at 100, 200 and 350 feet respectively. The property has been reported on by Mr. O. T. de Villiers, B.Sc., who considers the Seignury a sound mining proposition, and prophecies an average working profit of 8s. per ton, or £480 per month on a milling basis of 1,200 tons. With regard to the Kirkstall claims, on which but little work has been done, Mr. De Villiers states that the reef disclosed gives an average value of 20s. over a stoping width of 30 inches.

Rezende Mines.

Particulars of output of the Rezende Mines, Ltd., for the month of January, 1913, showing a total profit of £2,480, made up as follows:—Rezende Section: Tons milled, 3,600; total ozs. fine gold recovered, 1,406; estimated value of yield (gold and silver), £6,027; estimated profit after deducting London expenses, £1,656; add revenue from tributors, £550; estimated profit from Rezende Section, £2,206. Penhalonga Section: Tons milled, 4,500; total ozs. fine gold recovered, 827; estimated value of yield (gold, silver and lead), £4,447; estimated profit, after deducting London expenses, from Penhalonga Section, £274. Total estimated profit, £2,480.

Bucks Reef.

The consulting engineer in his report says:—Ore Reserves: At March last year, the ore in sight in both the Bucks and Prestwood Mines, amounted to only about 1,600 tons, sufficient for two months milling; it will therefore be seen that, since that time, the mill has practically been kept going on ore that was developed from month to month, and it is also evident that strictly speaking there are no ore reserves to-day. Reduction Works: During the year, 9,726 tons were crushed for a yield of 5,698 ozs. = 11·7 dwts. per ton (mill and cyanide). General Remarks: In view of the fact that the development in depth of both the Bucks and Prestwood Mines has been of such a discouraging nature, and that with such short ore shoots (as we have to deal with) the mining costs must necessarily increase as depth is attained, or in other words, owing to the grade of rock decreasing and the working costs increasing, the further expenditure of money by you, is most certainly not justified.

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Mine Captain's or Underground Manager's Billet.

By very energetic School of Mines Man, 34 years of age, with 12 years' mining experience and excellent references. Holder of Mine Overseer's and Mine Manager's Certificates of Competency (Raised Standard). Advertiser would also accept Manager's billet on an outside gold mining concern. Can do his own assaying, surveying and cyaniding.—Apply OVERSEER, c/o *S.A. Mining Journal*, Box 963, Johannesburg.

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MINE SURVEYOR (Certificated), requires appointment. Apply, A.I.M.M., c/o "S.A. Mining Journal," Box 963, Johannesburg.

SITUATION WANTED.

CERTIFICATED MECHANICAL ENGINEER, now and for some years Foreman Fitter on producing mine on the Rand, is open for better position. Capable, good at construction and maintenance, and thoroughly reliable. Replies to A.W., c/o "S.A. Mining Journal," Box 963, Johannesburg.

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Engineering Notes and News.

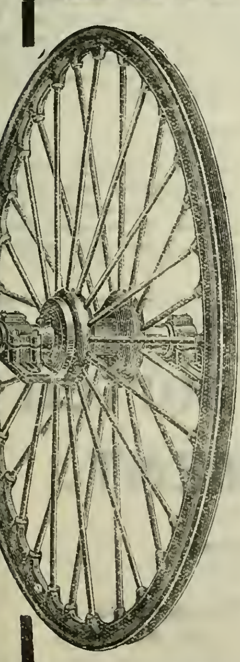
Mr. W. Lawson, late manager of the gas engine sales department of the British Westinghouse Electric and Manufacturing Co., manager of the gas plant and large gas engine sales department of Messrs. Crossley Bros., Ltd., Manchester, has recently been appointed sales manager of the Power-Gas Corporation, Ltd., producer gas and furnace specialists, Stockton-on-Tees. The Power-Gas Corporation are the makers of the "Mond" gas plants.

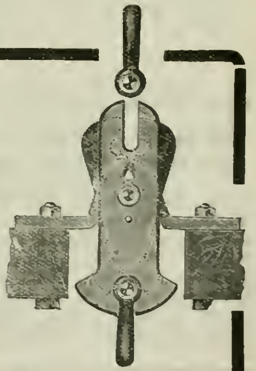
Treatment for Electric Shock.

At a recent meeting of the Electro-therapeutics Section of the Royal Society of Medicine, a lecture was delivered by Dr. Jellinek, of Vienna, a distinguished medical authority on electricity, in the course of which he emphasised the fact that after examining the conditions following a serious shock from contact with an electric current, neither the voltage nor the amperage that could be proved to have passed through the victim was sufficient to account for them. Circuits of 20,000 volts had been touched without very serious consequences, while accidental contacts with only 100 volts had resulted fatally in several instances. One-tenth of an ampere was usually regarded as sufficient to cause death in practically all cases, yet persons had had as much as one ampere passed through their bodies without a fatal result. The "accidental" shock was the most dangerous, since the influence of the mind was very great. As illustrating the importance of the psychological factor, Dr. Jellinek mentioned one case in which death occurred after contact with a high-tension conductor, though it was found that at the time of contact this was unconnected with the source of supply. Speaking of the symptoms produced, the greatest stress was laid on the constitutional or general symptoms. The breathing and the action of the heart were usually disturbed, but even the severest symptoms tended to pass off in shorter or longer periods. Stoppage of the heart was the most dangerous symptom, but it was important to bear in mind that, though this might have occurred, the person was not necessarily dead. He urged the necessity of applying first-aid in these cases without delay. Often lives were lost because those in the neighbourhood lost their heads or regarded it as essential to send for the doctor and wait till he came. If the victim was caught in wires he should be disentangled at once, or as quickly as possible, the person carrying this out, of course, taking every precaution to protect himself. Then artificial respiration should be applied, and preference was expressed for the older method, namely, Sylvester's, of performing this. In applying the Sylvester system the patient was placed upon his back, the upper part resting upon a rolled-up coat or rug, and the arms were brought up over the head and down again over the chest, where slight pressure was exerted. These movements should be repeated fifteen times a minute and kept up for half-an-hour or so. Absolute rest and quiet were necessary after recovery under artificial respiration of this kind, and Dr. Jellinek said he believed that many lives which had been lost could have been saved if an attempt to re-establish respiration and the action of the apparently dead heart had been made in the manner he suggested. He was of opinion that the greatest number of accidents resulted from disregard of the ordinary rules of safety.

New Patents.

659. Dr. Emil Cellett.—Process for simultaneously producing phosphates and nitrate of ammonia.
660. Norah Edith Hughes-Mahon.—Improvement in and relating to ladies' head-gear.
661. Benjamin William Bates, Henry Weldon Kelly and Douglas Haynes Corbin.—Improvements in target apparatus for use with cinematographs and the like.
662. Ernest Slatter Day.—Continuous setting and discharging vat.
663. James A'Henupy Fearon.—Improved process of and apparatus for purifying or desulphurizing hydrocarbon gases.
664. Ernest Clark.—Improvements in the manufacture of pneumatic tyres or covers.
665. Edward Dwight.—Improvements in dynamo electric machines.
666. John Frederock van de Velde.—Improved extension bar or column for mounting rock-drilling machines and the like.
667. William Herbert Lowe.—Improvements in electric batteries and electrolytes therefor.
668. Jens Andreas Johnsen Humberseth.—Improvements in machines for sharpening rock-drills and the like.
669. George Tom Cannon.—Improvements in rope-grips or jockeys for mechanical haulage and the like.





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Finance, Commerce, and Industries.

Building Plans. Nine municipalities in the Transvaal Province during the month of February approved plans having an estimated value of £150,768, as against £132,328 for the month of January, showing an increase of £18,440. Four municipalities in the Cape Province approved plans having an estimated value of £12,738. The Durban municipality passed plans having an estimated value of £13,971.

* * * *

German S.W. Africa and the Union. The following is a translation of the beginning of an article published in the *Suedwesbote* of 14th of February, dealing with the trade relations between British South Africa and German South-West Africa. "Below we give a review of South-West African trade during the fixed years of 1907-12 with its Southern neighbour. The object is to show the economical value which our Protectorate possesses for the Union of South Africa, and to give expression to the expectations which we from our side may hope to realise from trade advantages. We regard the present as a suitable moment for this purpose, as within the near future we intend to approach the South African market with slaughter stock, meat preparations, and perhaps other products, and to reap the benefit of neighbourhood with the Union of South Africa, just as our neighbour has done with us for years. The following are the totals of imports and exports between the Union of South Africa and German South-West Africa during the years 1907-12:—

Period.	Imports. Mk.	Exports. Mk.
1907	5,755,870	37,934
1908	4,949,647	61,157
1909	6,658,392	1,275,393
1910	6,571,215	195,253
1911	6,138,705	219,232
1912	3,855,878	338,837
	33,939,707	2,127,806

* * * *

The Rise in Land Values. Councillor Lucas submitted an interesting statement to the Local Government Commission last week, showing the original price paid for land and the present valuation. The Witwatersrand Township Estate acquired Jeppes, Doornfontein, and North Wolhuter in 1897 for £40,000. The present valuation was £451,420. Bellevue was bought for £46,000, and the present valuation is £64,275. The Johannesburg Consolidated Investment Co. purchased Yeoville in 1896 for £5,879, and the present valuation is £218,085. Berea and Doornfontein were bought for £45,638 in 1904; present valuation £413,415. The Braamfontein Co. acquired Parktown, Parkview, Westcliffe, Forest Town, and the remaining portion of a farm not laid out in 1893 for £6,000; present valuation £549,750, of which £268,435 is held by standholders. Mr. Geldenhuys bought Richmond in 1891 for £1,200; present valuation £24,875. Linden was bought in 1899 for £525; present valuation £4,980. The Consolidated Goldfields paid £8,000 for Booysens, which to-day is valued at £46,095. The Langlaagte Estate Co. bought Mayfair for £30,000, to-day's valuation being £260,500. The township of Kensington was bought for £100,000 in 1903, and it is valued at £281,501. Marshalls Township Syndicate "picked up a plum" in 1889 for £1,200 in the township which bears its name in the centre of the town. To-day's valuation is £1,588,233. The evidence was tendered in support of the contention that municipalities should rate site value only.

* * * *

Union Banking Returns. The position of the banks operating within the Union, as at the end of the year, which has been disclosed by the figures published in some recent numbers of the *Government Gazette*, is worthy of attention. Last June, it will be remembered, the total deposits amounted to £33,725,000, the advances to £30,942,700, and the cash reserves to £6,500,000. Such a position, in view of the unprecedentedly high percentage of advances to deposits, was a source of concern to responsible bankers; and it appeared as if, in view of the remarkable increase in advances which during the previous three years had coincided with a comparative scarcity of deposits, another period of restriction was imminent. However, the latest statistics show the total deposits at £35,894,600, or £2,169,600 more than those at the end of June last. Such a level, at a corresponding date, has not been reached since 1904. The total advances now have reached the record total of £31,842,700, or almost exactly £900,000 more than the figures at the end of June last. The cash reserve is £6,773,000, or £273,000 in excess of the figure at the close of the previous half-year. The percentage of advances to deposits now is just under 89, as compared with about 91 at the end of June last. The advances and cash on hand now exceed deposits by £2,721,000—a reduction of about £1,000,000 during the half-year. Thus it will be seen that the position has improved, from a banking point of view, without necessitating the adoption by bankers of a restrictive policy.

Messrs. Harvey & Co., Ltd. (Johannesburg branch), intimate that they have removed their offices from Consolidated Building to their own premises at the corner of Kruis and Frederick Streets. Street address: 76, Frederick Street. P.O. Box 953, Johannesburg. Telegraphic address: "Penpol." Telephone No. 2626.

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Automobile Notes.

The principal of the South African School of Mines has organised a class for motor engineering at the School in Eloff Street (near the railway station), Johannesburg. The class commenced last Wednesday at 7.30 p.m. until 8.30 p.m., and will be continued each succeeding Wednesday at the same hours until the end of the term on June 21. The subject will be treated by the lecturer in such a manner that those who have no prior acquaintance with motor cars or motor bicycles will be enabled to obtain a clear understanding of every constructive detail.

* * * *

The subject of engine-rating is again under discussion in America, where the A.L.A.M. rating is identical with R.A.C. rating, and is largely used by various States for taxation purposes. It is being condemned there—as, indeed, it is widely condemned in England, except by the R.A.C. and the tax-gatherers—on account of its neglect of the stroke factor. It is stated that in New Jersey an application will probably be made to the Legislature to establish each year special formulæ, as the conditions would demand, for the purpose of arriving at a true horse-power rating.

* * * *

The Motor, which is so actively urging the advantages of benzol as an alternative fuel to petrol, issues a warning to those who are buying this spirit for experimental purposes or direct usage, and says that in some cases the spirits offered for sale have contained no more than 50 per cent. of benzol. Of course, large firms with a reputation to keep up will naturally safeguard their own interests, and will not offer for sale unsuitable spirit, but with even 90 per cent. of benzol there is as yet no actual criterion of purity. It is well, therefore, to use a certain amount of discernment in effecting purchases of benzol from the irresponsible type of retailer, as a bad spirit may seriously damage an engine.

* * * *

The correspondence in the motor press on the subject of tyre inflation, raised by an article by Mr. Henry Sturmey recently in *The Motor*, shows that a large amount of interest has been attracted in regard to this important point in the economy of the motor car. The American manufacturers, by far the largest producers of pneumatic tyres in the world, are unanimous as to the importance of maintaining the correct pressure. The makers of the Goodrich tyres say that the upkeep of tyres is the greatest running expense of a car, but can be nearly eliminated by always keeping the tyres fully inflated. The Goodyear Tyre and Rubber Company and the United States Tyre Company state that 75 per cent. of the tyres returned for repairs have been driven insufficiently inflated. The additional friction heat resulting from driving slack tyres in conjunction with the constant bending back and forth of the fabric causes the walls of the casing to weaken and give way. The Diamond Rubber Company of New York write that the belief that hot weather and road friction increase the air pressure in a tyre to a dangerous point is a fallacy. Allowance is made in the manufacture for four or five times the pressure recommended for

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running. To get maximum mileage the car owner is advised to inflate according to a very simple rule—the pressure per square inch, as shown by the pressure gauge, should be eighteen times the cross section in inches. Thus a 4-inch tyre should be inflated to 72 lb., regardless of hot or cold weather. The Ajax tyre makers are of opinion that "every conceivable trouble known to tyres is likely to occur if driven in a soft condition." The Firestone Company states that "there is not a tyre made that will stand this abuse." The Lee Tyre Company says: "Never run on a slack tyre if it can be avoided, for it may destroy the tyre beyond repair." These opinions should be laid carefully to heart by the motor car owner, for, though the pneumatic tyre originated on our side of the Atlantic, the Americans have a longer and more extensive experience as workers of vulcanised india-rubber than we.

Motor Cyclists' Union.

The committee of the Rand Motor Cycling Club has taken the initial step towards the formation of a South African Motor Cyclists' Union, and not a moment too soon. It has been felt for some time past that a controlling body is necessary to reduce existing chaos to order, and weld the various conflicting interests of different clubs into a homogeneous confederation. With this end in view a meeting has been called for March the 28th, and delegates from all clubs in the Union of South Africa have been invited to discuss the question and, it is sincerely to be hoped, lay the foundation of a South African governing body. The reasons and the desirability of the establishment of such a Union are clearly set out in the letter which has been addressed to all motor cycling clubs in the four Provinces, and for the benefit of the sport in general it is to be earnestly hoped that the clubs will respond, and instruct their delegates to vote in favour of the establishment of a controlling Union.

Springs Mines.

The following cable was despatched to the London office of this company on the 17th inst.:—"Struck reef in north shaft, depth about 3,438 feet, width of the reef is about 33 inches, reef will be sampled as soon as fully exposed. publish."

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The Week's Company Meetings.

CASSEL COAL COMPANY.

A Successful Year.

The fifteenth ordinary general meeting of shareholders in the Cassel Coal Co., Ltd., was held on March 18, in the board-room, Lace Buildings. Mr. J. Dale Lace presided, and there were present or represented by proxy Messrs. J. H. Ryan, L. Edwards, W. Ross, Julius Jeppe, J. T. Goldsbury, E. M. Hind, E. H. Lamb, G. B. Pascoe, Sir Abe Bailey, Messrs. A. A. Barker, T. England, and the secretary Mr. J. G. Robertson, representing 126,641 shares out of the issued capital of £200,000.

Chairman's Speech.

The Chairman said: Gentlemen,—I have the pleasure to submit for your confirmation the balance sheet, profit and loss and appropriation accounts, and the directors' report for the year ended the 31st of December, 1912. In doing so, I may congratulate the shareholders on the fact that we have been able to earn the very respectable net working profit of £20,872. This is slightly less than our net earnings for 1911. That they approximate at all is due to the strenuous efforts of your board and those of the other colliery companies combined in the Coal Owners' Association, and not at all to any extraneous circumstances. By which I mean that you must not suppose that the grant grudgingly conceded by a reluctant Railway Administration of 1s. per ton rebate on export coal, has added to our profits.

Daggafontein.

The directors' report deals at length with the circumstances of the company, but I may mention a matter which has not for some time past been pressed on your attention, and that is your gold mining interests at Springs. As our report states, you own a lease of six hundred and thirty acres of the farm Daggafontein. Active development by the Daggafontein Gold Mining Co., Ltd., has been in process for some considerable time, their main shaft being now down some 1,950 feet. Their operations are to the south of your holding. To the north and west the Springs Mine, running peg for peg with your holding, are very actively pushing the sinking of development shafts, and I am pleased to tell you that in their eastern shaft, they have encountered the reef at a depth of 3,440 feet, so that before we have to meet you again there is likely to be considerable development in this district.

Landau Mine.

You will see from the directors' report that they have determined on a forward policy in respect of the Landau mine, feeling that the demands made and to be made on your mine are such that they are now fully justified in sinking and equipping a new shaft to meet the trade naturally falling to your company. The sinking of a new shaft on the incline is now well advanced, and the equipment of this shaft will be of the most recent and up to date possible. This practically means the opening up of a new mine, with a life of twenty years on an output of 30,000 tons per month. All this work we propose to accomplish out of profits, from cash in hand and to come, without interfering with the payment of dividends. It is scarcely necessary for me to point out that with a new mine with equipment that is up-to-date, facilities which we are likely to have in our new area, the cost of producing will be considerably reduced, and until such time as the whole equipment is fully paid for that additional saving in costs per ton will be available to go towards the payment of this new mine and equipment.

Our financial position, as you will see, is a very strong one, and your directors are without any doubt as to their ability to carry out their schemes without having to go to the shareholders for any money and without the creation either of new shares or debentures. The present pit has run for twenty years. We are now going to give you practically a new mine, and that out of our savings. I think what I have told you to-day should in the highest degree be satisfactory to you.

Kleinkopje Mine.

I will bring to your notice the report of the analyst who dealt with every section exposed by the boreholes on our Kleinkopje property. He says: "The seam is of great total thickness and contains in its upper portion a compact section six feet thick which gives an average calorific value, varying from 12.25lb. to 13.00lb. without any picking whatsoever. It could be easily mined to yield a product of even higher value than that cited. Further, above this section we have a further section, varying in thickness from 3ft. to 5ft. 5ins., which is also good coal and whose calorific value would probably average 11.21lb. and occasionally exceed 12.00lb. as it lays in the mine—i.e., without any picking whatsoever. Speaking more particularly of the coal itself, it may be described as typical high grade Witbank coal of normal moisture and ash contents, and well proportioned in regard to volatile matters. The working sections indicated above certainly carry an excellent steam, smithy and household coal." This farm is situate some ten miles distant from your present pit, and also from your new pit, and I have every right to claim to-day that we have proved an area of 26,000 acres (I must say more or less) of valuable coal in the very heart of the Middelburg coal fields, thus proving your company to be what I have ever claimed it to be, the biggest coal owner in Africa.

Chairman Justified.

There is one further thing that you must forgive me if I touch on, and that is this: that as chairman of this company some years ago, I incurred a considerable amount of obloquy in certain quarters inasmuch as I fought against a scheme for the reconstruction of this company, a scheme which would have left it largely in debt and still possibly embarrassed. In opposition to that scheme, I advanced another and carried it. What is the position of your company to-day? You have only to look at your balance sheet to see you are without any debenture debt or other hypothecation. You have paid off all your liabilities. You have a substantial cash balance in hand, and where a 5 per cent. dividend was promised you, you have recently received 7½ per cent., which dividend you are now here to confirm with your accounts. I hope that those shareholders who in 1909 were so opposed to the policy of the directors, ere now have seen the error of their ways.

Associated Collieries.

Your board have much satisfaction in informing you that during the period under review, the Associated Collieries, whose agreement expires by effluxion of time on the 30th of June next, have formally agreed to extend the association for a further term of five years after that date. The good work done by the association has been apparent to all, even to consumers, who are now assured of what is of the greatest importance to them, viz., a constant and unfailing supply of first-class coal at a favourable pithead price, and at what will be a moderate delivered price too when the light of reason is visible in railway practice. I now beg to move the adoption of the directors' report, balance sheet and profit and loss accounts, and the confirmation of the payment of dividend No. 9 of 7½ per cent.

The motion was carried unanimously.

Messrs. L. Edwards and Julius Jeppe were re-elected directors, and the auditors, Messrs. Diamond and English and C. Stuart, were reappointed.

Apart from the Chairman's references to the attitude of the Railway Administration on the question of coal export given on another page, which is being covered by a leading article.

ANGLO-FRENCH COAL.

Satisfactory Year's Results.

The eleventh ordinary general meeting of shareholders of the Anglo-French (Transvaal) Navigation Coal Estates, Ltd., was held on March 19, in the board-room at the National Bank Buildings. Mr. G. R. Airth presided and there were present Messrs. E. H. Read, G. W. Higgins, Gordon Sandilands, C. W. Southwood, E. Renaud, L. S. Raymond, secretary and G. W. Austin, representing 174,083 shares out of a total issue of 230,000.

Chairman's Speech.

In moving the adoption of the report and accounts, the Chairman said: Gentlemen,—You have before you the reports of the directors, consulting engineer and general manager and the audited statements of account as at the 31st December, 1912. These indicate, in a comparison with previous years, considerably improved results. The net profit on coal winning amounted to £14,689. This amount ,together with £1,864 brought forward, has been appropriated as follows: £12,000 for dividends Nos. 3 and 4 to preference shareholders; £3.000 to provide for extension of plant, depreciation, etc., as required by the articles of association, and £1,553 has been carried forward.

Preference Dividend.

At the close of the year the unpaid balance due in respect of the cumulative preference dividend amounted to £31,030 as against £34,630 at the end of 1911. It is hoped that, with the generally improved conditions and the better quality of the coal in the new seam, to which I shall refer later, the profits for the current year will permit of a further substantial reduction being made. I do not think there is any other item in the accounts requiring special mention, but I may, perhaps, point out that our "shares in other companies," have been reduced. This is due to the liquidation of the Kleinfontein group labour organisation on the formation of the Native Recruiting Corporation. We have not thought it advisable at present to join the latter, but if necessary will do so.

The output amounted to 262,666 tons, representing an increase of 32,974 tons as compared with the previous year. This is a very satisfactory increase, and it is worthy of note that the last three months of the year each in its turn represented a record month. At our last meeting, your chairman informed you that it was proposed to transfer the whole of our operations to the lower seam, and his anticipations of improved results have been fully justified. Since June all coal won has been produced from this seam. The quality is uniform and second to none in the Transvaal, the seam is fairly constant in width and as it contains no bands sorting has been reduced to a minimum. The rolls in the floor which caused so much trouble and expense in the upper seam are practically absent. A few small rolls have been encountered, but, up to the present, they have been soft and have not seriously interfered with mining operations. The more uniform and better conditions underground have resulted in a reduction in working costs, and it will be seen from the following figures that when the transfer took place and as the organisation of work on the lower seam progressed the profits improved. This improvement was also partly due to increased sales owing to the excellent quality of the coal, which finds a market not only locally, but also for bunkering and export. During the first two quarters of the year the profits averaged approximately £1,000 per month; for the third quarter, £1,300 per month; for the final quarter, £1,500 per month, and I may add that for January and February of this year the average is about £1,900 per month. The company's plant and machinery is working satisfactorily, but we find it necessary to instal an electric generating set capable of producing 100 to 200 kilowatts, at an estimated cost of £1,050. When this is installed, it will be possible to discard the air-pumps underground, and to free a large amount of compressed air which can be better employed in driving coal-cutting machines.

Our relations with the Transvaal Coal Owners' Association have been most satisfactory, and you will be pleased to note from the directors' report that this company, in conjunction with other members, has entered into a fresh agreement with the association for a period of five years from the 1st of July next, our allotment of trade being the same as in the past.

Railway Rates.

According to the Government returns, the sale of coal from collieries in the Transvaal has shown a further increase during the year. The quantity sold was 4,751,850 tons as against 4,343,680 tons during the previous year. The average price, however, was only 4s. 4.7d. per ton, which represents a falling off of 3.6d. per ton. In August last r revised tariff of railway rates for the carriage of coal came into force, giving effect to certain reductions both for coal consumed locally and for coal exported. The reduction granted in the latter case amounted to one shilling per ton. This, in the opinion of those who are interested in the trade, is welcomed as a step in the right direction, but to be of any real benefit in the way of developing a large export trade, a further reduction of at least one shilling per ton is essential. The board would like to take this opportunity of expressing its appreciation of the excellent services rendered to the company during the year under review by the management and staff; more especially I think a word of thanks is due for the excellent manner in which the transfer from the upper to the lower seam was carried out. During this transition period while the lower seam was being developed and the change-over taking place, all the work progressed without a hitch, and the output did not suffer.

I now beg formally to move the adoption of the report and accounts for the year ended the 31st of December, 1912, and also the confirmation of the action of the directors in declaring interim dividends Nos. 3 and 4 to holders of preference shares during the year.

The report and accounts were unanimously adopted.

A shareholder asked if there was any chance of the ordinary shareholders receiving a dividend, to which the Chairman replied that if the present rate of profits was maintained he expected that in about three years' time the ordinary shareholders would come in for a dividend.

The retiring directors, Messrs. William Dalrymple, G. W. Higgins, B. Hansford, A. Little, G. R. Airth, and C. R. Pinder, were re-elected.

Messrs. F. W. Diamond and English and Messrs. C. L. Andersson and Co. were appointed auditors.

On the motion of Mr. Renaud, it was agreed, in view of the satisfactory financial state of the company, to grant the directors an additional bonus of £300. In returning thanks for this the Chairman mentioned that the remuneration for each director worked out at about £180 a year.

Zululand Property for Sale.

Attention is drawn to the fact that tenders are invited and will be received up to May 1st, for the sale of the property and machinery of the (late) Tugela Mining Syndicate at M'Fongosi, Zululand. The property comprises 12 claims, each 600 x 600 yards, on the banks of the Tugela and M'Fongosi Rivers. The plant is a 40 h.p. turbine; water race 1,600 yards long; 3 stamp battery; battery house; 50-ton cyanide plant and extractor box; assay balance and chemical, etc. Permits to view the property may be had by intending purchasers. All communications to be addressed to Messrs. Smith & Stanford, P.O. Box 73, Greytown, Natal.

Tenders Accepted.

A building tender has been accepted from Mr. J. Barrow, contractor. Lorentzville, Johannesburg, for the erection of the South African Institute of Medical Research at a cost of £32,000.

The tender of Mr. A. Gill has been accepted for the erection of the Johannesburg Art Gallery Buildings at a cost of £44,249.

The correct interpretation to be placed upon the definition of "miner" in the Miners' Phthisis Act being doubtful, the Executive Committee of the Chamber of Mines is arranging, in conjunction with the Miners' Phthisis Board, for a test case to be brought with the view to obtaining the decision of the Courts on the matter.

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Further details can be obtained, and tenders are to be sent to the Manager, Mr. E. Bucher, Box No. 1767, Johannesburg.

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Notes and News.

Machinery at the Show.

Owing to the necessity of going to press early on Friday, a full, illustrated account of the machinery exhibits at the Agricultural Show has had to be held over till next week. It is enough here to say that the engineering side of agriculture was never better represented at the Show than on this occasion.

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East Rand Deep.

The annual meeting of the East Rand passed off uneventfully. The chairman summed up the position by saying that although the year had not offered a favourable opportunity of dealing with the property, the development of the neighbouring country had undoubtedly been very satisfactory. In view of the prevailing depression, the directors did not think the time had yet arrived for doing that exploratory work alluded to at the last annual general meeting.

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The York Syndicate's Returns.

The York is not a property that figures in the Chamber of Mines' monthly analysis sheets, and accordingly a large measure of interest attaches to the returns which were announced by Mr. Julius Jeppe at the annual meeting held on Thursday. It may be recalled that the York Gold Mining Syndicate was formed about six years ago to acquire and work the little property of that name on the Western Witwatersrand. The mine has achieved excellent things during this period. Floated with a capital of £37,000, the syndicate has repaid a loan of £13,000 which was obtained to complete equipment and re-start the mine, and has distributed amongst shareholders 100 per cent. in dividends. There is, too, every assurance of further distributions being made within the next few years. At the end of last year there were estimated to be over 30,000 tons of payable ore developed, and in addition to this it is calculated that there remain close on 90,000 tons to be developed. Furthermore, the accumulated slimes on hand are expected to give a profit of about £6,000. The York, like the Spes Bona, shows that profitable mining operations may be carried out on the Witwatersrand by working on a small scale as well as on a large one.

* * * *

The Institution of Mining and Metallurgy.

In submitting their report and statements of accounts for the year ended December 31st, 1912, the Council of the Institution of Mining and Metallurgy report that the progress of the Institution continues unabated. During the year, 150 members were admitted into the Institution and there were 49 transfers to Associateship or Membership. Professor S. Herbert Cox, A.R.S.M., was transferred from the list of Members to that of Honorary Members. The total membership at December 31st, 1912, was 2,258, as compared with 2,191 on December 31st 1911. The growth of the Institution is shown, which gives the membership at the end of the 7th, 14th and 21st years:—1898, 585; 1905, 1,324; 1912, 2,258. The maintenance of the standard of qualification for admission to Membership and Associateship, required by the by-laws, necessitated the rejection of a considerable number of applicants for admission.

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The Council's Awards.

The report of the Institution of Mining and Metallurgy deals with the allocation of the annual awards, as follows:—"The Consolidated Gold Fields of South Africa, Ltd.," Gold Medal has been awarded to Mr. Charles Olden Bannister, Assoc.R.S.M., M.Inst.M.M., for his paper "On the Theory of Blast-Roasting of Galena," which embodies the results of his researches on the subject. "The Consolidated Gold Fields of South Africa, Ltd.," premium of Forty Guineas has been awarded conjointly to Messrs. E. Hatschek and A. L. Simon, M.Inst.M.M., for their paper on "Gels in Relation to Ore Deposition." The prize of

Twenty Guineas, presented by Mr. Frank Merricks, M.Inst.M.M., for the best contribution to the *Transactions* during 1911-12 by an Associate, has been awarded to Mr. Arthur Thomas French, Assoc.Inst.M.M., for his paper on "Quick Combination Methods in Smelter Assays." The "Arthur Claudet" and "William Frecheville" Students' prizes of Ten Guineas each have been combined and awarded to Mr. H. Standish Ball, M.Sc. (McGill), Stud. Inst.M.M., for his paper on "The Economies of Tube-Milling." Post-graduate scholarships of Fifty Pounds each have been awarded to Messrs. W. R. Cloutman, A.R.S.M., H. Eyden, A.R.S.M. (both in the Mining Division), and D. B. A. Schuitema (Camborne). The scholarship awarded to Mr. H. Eyden had been previously awarded to a graduated in the Metallurgical Division of the Royal School of Mines (Mr. W. A. C. Newman), but as he became ineligible owing to his having accepted a staff appointment, it was awarded, as stated, to the second graduate in mining—Mr. H. Eyden.

* * * *

Geygerle.

Apparently, the Geygerle property is to remain a little longer in the doldrums. At the annual meeting this week Mr. Julius Jeppe, in moving that the report and accounts be adopted, said:—"The balance sheet in your hands calls for no special comment, as all the items remain more or less the same as last year, the only addition to the figures being the necessary current expenditure, which, after deducting the rents received, is £252 5s. 1d. for the year. No opportunity has offered during the year of dealing with your property, the value of which, however, has undoubtedly been considerably increased by the very satisfactory results obtained by development work on the adjoining properties." The directors' report and accounts for the year ended December 31, 1912, were duly adopted.

* * * *

Rhenoster Mines and Leeuwpoort Tin.

At the annual meeting of the Rhenoster Mines this week, the chairman, Mr. Julius Jeppe, said, *inter alia*:—"The share investment account now stands at £19,491, as against £1,135 last year, also due to the interest in the Leeuwpoort Tin Mines; and the item 'Mining Ventures and Options' which appeared in the previous year's accounts is now wiped off, as the Leeuwpoort Tin Mines have paid a sum of £10,470, and as an amount of £2,317 has been written off as depreciation. The balance at profit and loss account is virtually the same as it was for last year, the profit for the year 1912 being £72. Turning to the profit and loss account, you will notice that the current expenditure has been £618, as against £677 last year, and that interest received on money loaned is about £300 less than last year. I am glad to be able to tell shareholders that the interest in the Leeuwpoort (African Farms) Tin Mines, Ltd., promises to turn out a very profitable one."

* * * *

Accidents in British Mines.

The British mineral statistics for 1911, as reported by the *Mining Journal*, show that the fatality rate in coal mining in that year was only 1·308 per 1,000 men employed, as compared with 1·917 in 1910. The rate in 1911 was the lowest ever recorded. The *Mining Journal* considers that this is evidence that the constant agitation of recent years has led to greater care. This is probably correct in so far as the general trend is concerned, but the remarkable reduction in the death rate in 1911 impresses us as being due partly to fortuitous causes and not yet to be accepted as a new standard. Thus in 1911 there were only 34 deaths from explosions, against 496 in 1910. Falls of ground killed 635 men in 1911 and 658 in 1910; shaft accidents 109 in 1911 and 96 in 1910; miscellaneous underground accidents 372 in 1911 and 404 in 1910. Except in the matter of shaft accidents all of these figures show progress in the right direction, but not so much as the ratio per 1,000 indicates on its face. In metal mining the fatality rate was 1·31 per 1,000 in 1911 against 1·91 in 1910. It is noteworthy that in each year the ratios were as high as in coal mining. In other countries also this is found to be the case, and it is now generally recognised, contrary to former *a priori* conclusions in the absence of accurate statistics, that metal mining is quite as dangerous a vocation as coal mining, although it is free from the great special risk of the latter.

* * * *

The Last Drop of Industrial Blood.

Discussing the question of manual and mechanical efficiencies in and on the mines of the Rand, a well-known consulting engineer made an interesting and instructive remark to us the other day. "I am not at all sure but that we have attained to a profitable maximum of efficiency in certain directions," he said. "Of course, there is vast room for improvement in many departments, but I believe that in some it would be a bad commercial transaction to endeavour to secure larger results than are at present being obtained. To make my point quite clear, let us take as an example a metallurgical plant, the residues from which are, say, ·4 dwt. per ton. It is probably very good business to keep them down to that figure, but it is quite conceivable that in reducing them to ·3 dwt. the extra recovery of ·1 dwt. might be more than absorbed by additional cost. The simile might be extended to various other branches of Rand practice. The last drop of life blood, as it were, is invariably costly to secure—often so costly that it does not pay to get it, and I think this is a view of industrial economics that has so far been largely, if not wholly, lost sight of on the Rand."

* * * *

The Shamva Railway.

A new chapter in the history of the Shamva Mine is about to be written. The branch railway from Salisbury is now practically completed; indeed, construction trains were running to within five miles of the property a week or two ago. There then remained only a few lengths of rails to be laid on the completed track and a few minor alterations to the Poorti Bridge. It is expected that the line will be thrown open to traffic before the end of this month. As soon as the line is through construction work will be commenced in earnest. The heavy machinery, which the wagons hitherto have been unable to transport on account of the bad state of the roads, will then be delivered, and in a few months' time the company should be in a position to drop a certain number of the Nissen heads.

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The Oceana Company in Katanga.

The ubiquitous Oceana Company, which has interests in Africa from south to north and east to west, is reported to have acquired the majority of the shares in the Dufira Katanga, one of the principal companies formed in Brussels for developing the mineralised region of Katanga, in the Congo Free State. It is understood that the price paid was one hundred thousand sterling, and that a policy of active development is to be inaugurated.

* * * *

More Mining Regulations.

Through its Trades Hall friends, the *Rand Daily Mail* has been favoured with an advance copy of the amendments and new regulations prepared by the Mines Department, and they cover practically the whole field of debateable points as between worker and employer. They are mainly devoted to removing the possibility of ambiguity. The restriction of skilled mining to whites is extended to Natal, leaving the Cape as the only Province in which the coloured men may be banksmen, gangers, or onsetters. And it is made perfectly clear that only white persons can be in charge of a cage, skip, "or any other means of conveyance" for human beings underground. More responsibility is placed on the miners, engine drivers, etc., in the matter of seeing that the regulations are carried out. Coal mining receives a very large measure of attention. Ventilation is dealt with in a new sub-section, which insists on return airways, and voluminous sub-sections govern the question of inflammable gases, lighting, roof sounding, timbering, etc. The necessity of restricting the charging of holes and the firing of same to white holders of certificates is emphasised. Anyone who "permits" non-certificated coloured men to do so is made guilty of an offence. The miner, too, is made responsible for his explosives, and must take all possible and reasonable precautions to prevent anyone from taking explosives to the surface.

* * * *

To Prevent Accidents.

Inter alia, the proposed regulations make special provisions for guarding against drilling into misfires. In shaft sinking or in any vertical shaft all the ground within three feet of a hole is to be blown over by compressed air or by water under sufficient pressure to expose any misfires or sockets, and a sketch plan must be made for reference. In winzes and drives a shift boss must see the face for himself—must make a personal inspection during the shift—to see that the same process of clearing the face to expose misfires has been properly carried out. More stringent precautions are taken for sounding the hanging wall within 30 feet of the working face. The manager may, on written instructions, insist on a greater distance. No hole is to be drilled less than six inches from a misfire or likely to come within six inches of the line of the misfire. Provisions are made as to the contents of contract agreements for underground work. The contract is to be accompanied by a plan, divided into sections representing a fathom each, showing the face of the stope and also each line or point from which measurements to the face have been taken. The contract must also state the price per unit and the charges to be made for the chief items of stores and labour. These, it will be noted, are among the chief points for which the miners were contending before the Conciliation Board. On this question of measurement two other concessions are to be made to the miners. An additional section makes it clear that the contractor (miner) "or his representative" should have the right to inspect that portion of the mine plan which covers his own work at all reasonable times. A further addition states that in the event of a miner being dismissed for other than a conviction in a competent court for a breach of the regulations or a serious breach of discipline the manager should either stop the work and have the place surveyed within 24 hours or should permit the miner to continue work until a survey of his working place has been made, and until 24 hours after the cost sheet has been delivered. The miner then has twenty-four hours to demand a check survey. A miner convicted in a competent court, who refuses to exercise his right to continue work, loses his right to a check survey. It is to be obligatory on the mineowners to cause blasting operations and shifts to be so arranged that no workman is exposed to the fumes and dust from blasting. Again, in no case should a miner have charge of more places than can be visited without undue haste in the course of forty minutes. A record must be kept by the mine overseer or shift boss of the time of the departure from and arrival at the surface of every white person working underground. If this provision is workable it will provide most important evidence on the question of the time the miners have to spend underground. Copies of the new regulations are in the hands of the Chamber of Mines and the Miners' Association, and suggestions from these bodies must be completed before the middle of next month.

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City Deep.

Out of 194 stamps erected (including 4 Nissen's) the City Deep last month operated 150 stamps and crushed 41,900 tons for £79,581, and earned a profit of £27,329, working costs being at the rate of 24s. 4·9d. per ton. The output, despite the shorter month, was only £408 less. In the last three months of the year the Main Reef Leader disclosures showed considerable improvement in value with diminished width. The amount of driving carried out was considerably below that announced in respect of the other three quarters of the year, on account of shortage of labour. The position has, however, improved materially in this respect of late and henceforward the company should be in a position to substantially increase the ore in reserve.

TOPICS OF THE WEEK.

AGRICULTURE AND THE MINES.

The annual show week of the Johannesburg Agricultural Society has once again provided an object-lesson in the intimacy of the bonds that bind the mining and agricultural industries of South Africa. It will be remembered that the successful resuscitation of the Witwatersrand Agricultural Society in 1907 was due primarily to the public-spirited efforts of certain leading men on the Rand, led by Sir Lionel Phillips, who prevailed upon the mining houses to give the necessary financial support to the then moribund Society. Every year since then the Rand has continued to contribute to the progressive financial needs of the Society until to-day the show ground at Braamfontein stands a monument and a record to the practical interest of the Rand in what Lord Selborne once called the other limb which supports the prosperity of South Africa. In two short but thoughtful speeches which, as President of the Witwatersrand Agricultural Society, Sir Lionel Phillips was called upon to make on Wednesday, attention was called to the features of this year's show as they strike the close student of agricultural progress in South Africa. The Government continues to lend the Show hearty support, though for our part we cannot help regretting that both the Governor-General and General Botha should find Easter week too busy to admit of a visit. The exhibits of cattle and live stock this year boast gratifying advances in number and quality, and, indeed, it is difficult to find any section wherein progress is not shown. The lesson of the whole is the rapidly increasing ability of South Africa to support itself. In produce, small and big live stock, and the hundreds of classes into which the exhibits are divided this is evidenced. Nor is this feature confined to raw produce alone. In the minor preparations of the household, in the local industries that have already taken root in the Transvaal, and in several examples of local manfacturing ability at the Show there are signs of great potentialities for the future. To the thoughtful, therefore, the Show is less a mere congeries of miscellaneous products of varying degrees of excellence, than in the famous words of Dr. Johnson, "the promise and potentiality of wealth beyond the wildest dreams of avarice" for South Africa. That, to our mind, is the outstanding value of the Show. Not only is it a unique and unprecedented advertisement of the agricultural possibilities of the country, but it is a stimulus and incentive to our progressive farmers and an object lesson to the croakers and the pessimists. Prosperity is assured for the farming industry in South Africa, and none will welcome it more than the mining people of the Rand. To take the very lowest ground, anything that can lighten the burdens of this overtaxed community must, for selfish reasons, be welcome, and the growth of the business of agriculture carries that blessing among others in its train. Again, with the increasing productiveness of the country, the absurd cost of living—due as much to the apathy of the older rural population as to the hustle of the newcomers—must naturally diminish, and several of the evils attendant upon that abnormal condition of affairs must pass. Another aspect of this week's Show was likewise memorable. Never were the exhibits of agricultural machinery so costly, varied or numerous. Several of our leading Rand firms vied with one another to put before the farmer labour-saving devices, cheap power producers, and the most modern appliances applicable to every variety of agricultural operation. The labour and expense entailed are bound sooner or later to produce good results, and we believe sooner rather than later. As we showed recently the agricultural machinery imports into the Union are growing steadily, and South Africa bids fair, at the present rate, soon to become one of the most important consumers of that class of manufacture in the world. Her own chances of catering for the market are still remote, and for many years to come manufacturers should find here a wide and growing field. The automobile section of the Show was hardly less significant. With improving roads and the expanding wealth of the farming community the country is bound to absorb a yearly increasing number of motor vehicles of all sorts. Thus, farmers, merchants and manufacturers in particular, and all thoughtful and patriotic South Africans in general will find in the success that has crowned the Rand Show of this week a timely and valuable stimulus and inspiration.

THE TRUTH ABOUT WHITE LABOUR.

Though the Government would not consent to the adoption of Sir Percy Fitzpatrick's motion to oppoint a Commission to enquire into the possibility of increasing the sphere of white labour, a Select Committee has been nominated to deal with the matter. Sir Percy's motion had the good effect of calling forth a debate in the House of Assembly, during which some useful light was thrown on the subject. Oddly enough, young men's debating societies have again been bestirring themselves on the question and the papers have recently contained long extracts from speeches by amateur statesmen who would run the country on the impracticable lines long familiar to us under the name of Creswellism. First of all they would have the Mozambique natives go. This, the young men who dream dreams agree with the Labour Day demagogues, is the first desideratum of a South Africa, great, white, glorious, and free. It is not enough for these visionaries to be told that were their wishes fulfilled half the mines on the Rand might have to close down, and the credit of the whole industry be irretrievably ruined. They know better. Their private informants in the chancelleries of Europe and on the Bourses of the Continent have told them otherwise. Now the men on the mines themselves are the best judges of the labour fallacies continually being trotted out by their leaders and by the young bloods of the debating societies. Invariably the men are against any change in the present treatment of the coloured labour status. They recognise only too clearly that their whole basis of payment and status as supervisors would be jeopardised by any tinkering with cheap whites and by State interference with the natural flow of native labour to the mines from every part of South Africa, not now a prohibited area. Therefore, people who profess to champion the interests of the white miner while crying out for the removal of the black man who alone makes the former's existence economically justifiable, do not know what they are about. If they do know, they are open to a charge of dishonesty. They cannot have it both ways.

THE POSITION OF RHODESIA.

The receipt on this side of the full text of the Chartered Company's report and of the rousing speech of Sir Starr Jameson, together with a statement of policy delivered in Salisbury at a representative gathering of Rhodesians by Mr. Rochfort Maguire, renders the present an opportune time for considering the position of Rhodesia. We ourselves have on recent occasions had cause to discuss the state of affairs obtaining in the dominions of the Chartered Company. We have gathered from wholly reliable sources, backed up by a personal and fairly intimate knowledge of the country, that there have been great disappointments in many directions. Mines of which great things were expected have proved lamentable failures, farming areas from which rich harvests were anticipated, have, mainly as a result of the drought, given poor returns. There has been no material increase in population, and a larger population, it is universally admitted, is the principal requirement of the country. We sincerely and fully believe that the statements made above are substantially correct and on the face of them Rhodesia must, to use a common expression, be in a very bad way. There are many in Rhodesia, and many more who have returned from that country to other parts of the Union, whose opinions are entitled to respect and who assert that the position most certainly is unsatisfactory. A study of the annual report does not altogether dispel this impression, but anyone who was privileged to listen to the great speech made by Sir Starr Jameson in the Great Hall of the Cannon Street Hotel a week or two ago could hardly have left the meeting without feeling that notwithstanding all adverse rumours the assets of the British South Africa Company are in a flourishing condition. One thing is certain, and that is that not since the days of Cecil John Rhodes himself has there been such a meeting. Never, probably, has such an optimistic declaration fallen from the lips of a chairman at a gathering of Chartered shareholders. We believe it was Oliver Wendell Holmes who declared that it was not so much where one stood as the direction in which one was going that really mattered in life. Sir Starr Jameson appears to have admirably applied this principle to the Chartered Company and its great estate. He showed that they had one hundred million acres of land in Southern and Northern Rhodesia, that the land was increasing in value, and that with a continuance of present policy they would secure settled areas and more inhabitants. In the course of his speech, Mr. Birchenough, who spoke after Sir Starr, said they were asked why they could not get 10,000 or 20,000 immigrants in the year instead of 1,000. They could not do it because the conditions of Rhodesia were totally different from those of Canada or Australia. They were at a much earlier stage of development and they had a large native population which entirely supplied the demands of the unskilled labour market. People talked about 25,000 white people in Southern Rhodesia, but forgot that these were all of the employing class, and that there were 700,000 blacks." Sir Starr dealt in enthusiastic terms with the new mines. He stated that they would mean increased royalties of £100,000 per annum, and he remarked that they had established a good government, paying its way, and they had behind them a globular sum of £2,300,000 as reserve and working capital. In discussing the political aspect the chairman dealt with the three alternatives to the present form of Government—Crown Colony Government, full Responsible Government, and absorption in the Union. Sir Starr declared that he did not think there was the least chance of the people of Rhodesia choosing to take the retrograde step of Crown Colony Government under the aegis of Downing Stereet. Under certain conditions Sir Starr seems to favour absorption of Rhodesia by the Union, but he affirmed that full Responsible Government was the ideal of the people in Rhodesia and was also the ideal of the Directors of the Company. In this connection the declaration of policy by Mr. Rochfort Maguire in Salisbury contained many important points, not the least interesting of which was his statement: "Representative Assembly of a certain size and capacity is an indispensable preliminary to self-government, and that we propose to build up. When you have got such an Assembly, you can have self-government." No doubt the shareholder will again turn to the expression of opinion, so often repeated, that from the point of view of the Imperialist this is all very fine and magnificent, but that from the standpoint of the investor who for years and years has awaited the payment of dividends the future political status of Rhodesians is a matter of no material consequence. We can quite understand this view; to a certain extent we can sympathise with the shareholders. But at the same time it must be recognised that the British South Africa Company is a very different concern to the majority of other companies. Putting on one side for a moment the question of Imperial value, it must not be lost sight of that the vested interests of the company are enormous and the industrial assets scarcely within the comprehension of shareholders in ordinary limited liability concerns. After all, the importance of the dividend aspect—the immediate aspect—may very easily be overrated. The country is young and it will take time to develop. The nature of that development will depend on the people of the country as well as on its directors. And in this regard we cannot do better than quote the eloquent appeal of Mr. Maguire to his audience in Salisbury: "To the leaders of opinion in this room and elsewhere I confidently turn. As has been finely said, you are, as it were, carving your names on the rind of a young tree, and you will find them written in larger letters as the trunk expands. That young tree is the nation of Rhodesia. See to it that the names are written in characters straight and clear."

THE GOVERNMENT LEASES.

Apathy on the Part of High Finance—Absence of Speculative Possibilities—A Matter for Government Consideration.

The scheme of Government leases, which was substituted in the last gold law for the ancient and more exciting method of individual pegging, does not appear to have proved an unqualified success. The first area for which tenders were called was tendered for by various parties and eventually secured by the Barnato group upon terms which the Government themselves have tacitly admitted to be rather too good to be renewed in any subsequent enterprise of a similar kind. The terms of the lease were modified in the case of the Brakpan area in favour of the prospective tenderer, but although applications were called for as far back as the middle of last October no response has yet been made to an invitation which the Government doubtless thought to be sufficiently alluring. The time limit for tenders was originally put at the 28th day of February, 1913. but since no tender was received by that date, presumably, a second notice was issued on the 8th March, which stated that the time limit had been extended to the 30th June, 1913, and allowed it to be understood that a less stringent attitude would be taken up by the Treasury in the event of the guaranteed capital not being provided within a specified time, and that the question of the Government share of the profits would be susceptible of discussion as to the manner in which it might be paid. It remains to be seen whether the new conditions are likely to appeal much more strongly to capitalists than did the original ones. Only a few days before the modified Brakpan proposals were placed before the public, applications were invited for tenders in connection with the proposed lease of 1,180 claims on the adjacent farm Witpoort. Here, in spite of the depressing example of the previous failure, and at a time when the unsuitability of the terms of the Brakpan-Schapenrust lease must have been engaging the profound attention of the Minister of Mines, an exactly similar set of proposals were made for the Witpoort scheme. The latter is, of course, a smaller undertaking, in which less working capital, and a much smaller guarantee are involved, but, *pro rata*, the objections to the old Brakpan-Schapenrust terms are, presumably, as real in one case as they are in the other. To insist upon them as regards Witpoort while being ready, and, indeed, obliged, to make them less unattractive in the other instance, scarcely argues that this Government lease business is being dealt with in a masterly sort of way.

An Unconsidered Factor.

An examination of the terms stipulated with regard to the various leases at present under public consideration, including that of the Government Areas (Modderfontein), and the very obvious fact that capitalists are not rushing at the bait, lead one to the conclusion that the Treasury and the Mines Department have not yet grasped the underlying principles of mining finance. The average investor of modest means may be content to place his money where he can get a fair rate of interest for his money with a tolerable amount of security, but the individual who is responsible for the finding of three-quarters of a million or a million pounds sterling of working capital, under a penalty which ranges between £40,000 and £60,000, is not going to take the business in hand unless he sees a pretty considerable profit in the underwriting. Since the Government will not countenance a proceeding in connection with these leases which is the invariable accompaniment of promoting enterprise under other circumstances, it is clear that those who tender for the leases must rely upon the speculative instinct of the public to make up the deficiency. It is all very well to take up a lofty moral position in regard to these schemes. High finance, as it is called, is notoriously not in favour of discussing ethical principles and business methods in the same breath, nor, very commonly, of discussing the former subject at all. Those of us who have not the opportunity of dealing with millions are free to moralise as we like upon this, doubtless regrettable, state of things, but we cannot disregard facts. The Government are apparently ignoring the fact that the speculative element is certain to figure largely in the calculations of those who alone have the means of handling the leases, and until the allowance is made for this circumstance there is the prospect of the Brakpan-Schapenrust and Witpoort schemes being left severely alone for an indefinite period.

Some Comparisons.

As indicating the range of profits made by the Mines of the Further East Rand, the following figures, taken from the Chamber of Mines analysis for January last, are of interest:—

Mine.	Recovery per Ton Milled.		Costs per Ton Milled.		Profits per Ton Milled.	
	s.	d	s.	d.	s.	d.
Brakpan Mines	30	8	17	4	13	3
Geduld	27	9	21	7	6	1
Modder B.	34	10	17	5	17	0
New Kleinfontein ...	27	10	18	3	9	3
New Modderfontein ...	38	1	20	2	17	6
Van Ryn	27	10	15	10	12	0

Assuming that each of these companies were working under the conditions of the Brakpan-Schapenrust and Witfontein Government lease terms, the proportion of profit accruing to the Treasury and to the companies, respectively, would be, roughly, as shown below:—

	Percentage of Profit to Recovery.	Government Share of Profit		Company's Share of Profit.	
	%	s	d.	s.	d.
Brakpan Mines	43	5	2	8	1
Geduld	22	1	4	4	9
Modder B.	50	7	2	9	10
New Kleinfontein ...	33	3	0	6	3
New Modderfontein ...	46	7	0	10	6
Van Ryn	43	4	8	7	4

It is easy to see that the market prices of these companies would be materially lower than they are to-day if the second table represented their earnings. The highest valued share, at the beginning of March was that of the Brakpan Mines, Ltd., which stood at 4 5-16, but the profits of the company are exceptionally high and a dividend of 40 per cent. was paid out last year, with a promise of a better one later on. New Kleinfontein paid 12½ per cent. with a recovery of 27s. 10d. and a working cost of 18s. 3d., both of which latter figures would not be a bad average to take for the Further East Rand as a whole. It is likely to do better, but the market price at the commencement of this month was only £1 1-32. There is the life to be considered, of course, and it is unquestionably small in comparison with one of the Government Areas. The profit of 6s. 2d. which would be received by the company on Government terms is approximately that which, under favourable conditions, we suggested as a basis for comparison in the case of the Brakpan-Schapenrust undertaking. Obviously the promoters and guarantors of such a venture have not great things to hope for from the market. A profit of 6s. 2d. per ton milled, with a stamping capacity of 750,000 tons per annum, a sufficiently large crushing to arrange for, at the outset at any rate, would, if paid out to the last farthing—naturally, a remote possibility—be equivalent to about 18 per cent. on the total capital of the company. The actual dividend would, of course, be well under this figure, and, as we have previously observed, the investor might be more or less satisfied, but the individual who had staked large sums, and looked to the market to recompense him, would probably not feel too happy about it. It would then be possible to make some estimate of the position; as things are the capitalists who are asked to finance the Government lease areas are altogether in the dark as to what profits, and therefore dividends, are likely to be. In conclusion, it is only necessary to point to the circumstances of the Government Gold Mining Areas (Modderfontein) Consolidated, Limited, who have already gained a little information about the quality of the reef they are to mill later on. The market price on the 1st March was £1 1-16. No one doubts the solidity of this concern as an investment; but if it were necessary to put it up for tender under conditions similar to those which were laid down originally it may be doubted whether the same competitive endeavours to secure the prize would again be witnessed.

REEF STRUCK IN THE SPRINGS MINES SHAFT.

An Important Intersection—Shaft and Borehole Values—What the Strike Signifies—Tonnages and the South Shaft.

The estimate of Mr. C. E. Knecht, Consulting Engineer to the Springs Mines, as to the date and depth at which reef would be encountered in the No. 1 or north shaft of the property has been well borne out in actual result, intersection being effected about the middle of March as predicted, and at a depth of 3,432 feet.

The Values.

The ore body disclosed is of good width, and whilst the assays are certainly not phenomenal the values disclosed may be described as satisfactory. The following are the official details of the strike, as cabled to London:—Actual depth of reef, 3,432 feet; reef now fully exposed in the shaft; assays as follows: North section, being northern 30 feet of shaft, representing 69 feet sampled, 3·03 dwts. over 32·5 inches; South section, being southern 12 feet of shaft, representing 33 feet sampled, 10·9 dwts. over 40 inches; average for the whole shaft, 5·95 dwts. over 34·9 inches. The Springs Mines north shaft is 42 feet by 9 feet, and for purposes of sampling the ground exposed was divided into two sections. The results were:—Northern section, 30 feet by 9 feet, gave 3·03 dwts. over 32·5 inches; Southern section, 12 feet by 9 feet, gave 10·9 dwts. over 40 inches; average for the whole shaft, 5·95 dwts. over 34·9 inches. Obviously the section of reef so far exposed in the Springs Mines is, as to its mynpacht area of about 1,160 claims, as a drop to an ocean, and too much significance or importance must not, therefore, be attached to the values so far located. At the same time the result may certainly be regarded as very encouraging.

Broad Significance of the Strike.

Apart from the influence of the intersection on the Springs Mines property itself, the cutting of the reef in this shaft at a depth of between 3,400 and 3,500 feet must be regarded as an event of great importance to the Further East Rand area generally. It should be appreciated that the shaft is an isolated one. As will be seen from reference to the accompanying plan the two nearest producing mines are the Brakpan, which is five miles distant and Geduld, four miles away. The position at both these properties is eminently satisfactory at present. Additional equipment is being erected or is about to be erected at each, and the profit earned by the Brakpan Company last year was £444,000.

Borehole Results.

There has, of course, never been any doubt as to the existence of reef in the Springs Mines area, and it may be recalled that about ten years ago boreholes were sunk on the property which gave the following results:—No. 1 Borehole (near which the north shaft is located): Depth to reef, 3,477 feet; surveyed depth to reef, 3,098 feet; assay value per core, 28·42 dwts. over 18·56 inches. No. 2 Borehole: Depth to reef, 3,617 feet; assay value of core, 21·42 dwts. over 10·81 inches. This borehole was not surveyed. No. 3 Borehole: Depth of reef, 4,960 feet; surveyed depth to reef, 4.500 feet. As the greatest part of the core was ground away no information is available as to the assay value. Such evidence as is at present available prompts one therefore to the view that the Springs Mines area will be proved to be a payable proposition, and without indulging in any rash optimism one is seemingly warranted in anticipating that within the next few years the Springs Mines Co. will be crushing with an equipment at least the equivalent of that in operation on the sister mine under Consolidated Mines Selection control—the Brakpan.

The South Shaft.

The south shaft, it may be recalled, had at the end of the year reached a depth of 2,850 feet. This latter shaft is situated considerably to the south of the No. 1 or north shaft, but on account of the flatness of the reef it will not have to go much deeper than the No. 1. In connection with this matter of the low angle of reef dip it may be remarked that whereas the property is distant nearly 30,000 feet or 5¾ miles from outcrop reef is encountered at an easily workable depth. The mynpacht area of the property, in terms of the Gold Law, will equal about 1,160 claims. Assuming a width of reef of just under three feet and an angle of dip of five degrees throughout the mine the ore contents of the property may very roughly be approximated at about 15,000 tons per claim without making allowance for faults, sorting and disturbed ground.

The Financial Position.

At the end of last year, according to the published accounts, the cash, and cash assets, less liabilities of the Springs Mine, amounted to rather more than £60,000, of which about £10,000 was represented by stores on hand, leaving a balance available of slightly more than £50,000. In addition, £15,000 is invested in Victoria Falls and Transvaal Power Co. 6 per cent. cumulative preference shares. Having regard to the noteworthy success achieved by the Brakpan Mines no difficulty should be experienced provided development results are satisfactory in the finding of sufficient funds to bring the property to the milling stage. Altogether the strike must be regarded as one of first-rate importance, not alone for the Springs Mines Co. but for the Rand as a whole, and particularly that section known as the Far East Rand.

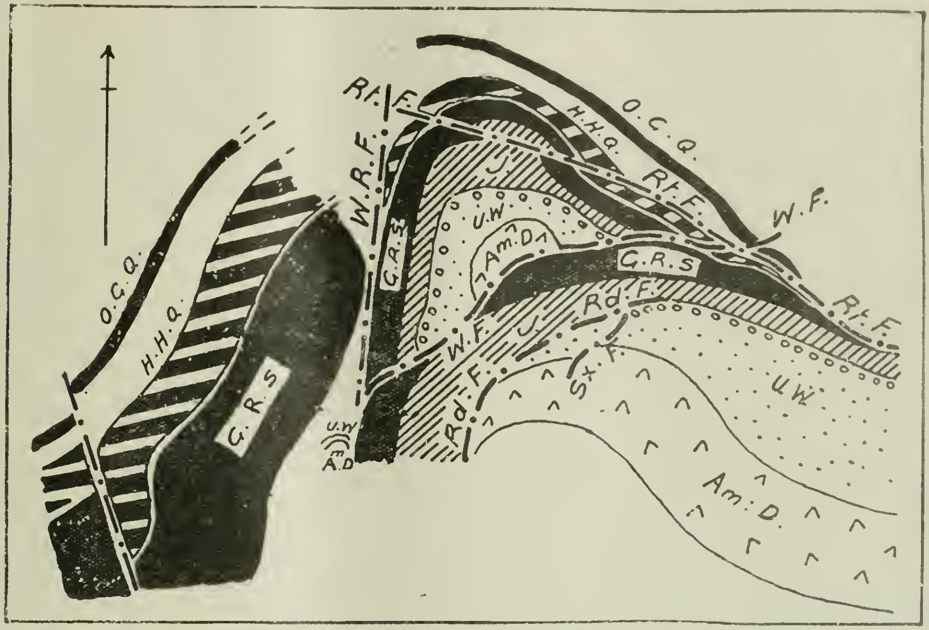
Rooiberg Minerals Development Co.

The following are the particulars in regard to the operations on the Rooiberg Minerals Development Company's property for February:—Stamps, 10; days run, 27·048; tons milled, 2,825; concentrates, 100 long tons; average assay value metallic tin, 69·68 per cent.; estimated profit, £7,762 6s. 3d.; adjustments in respect of previous shipments due to fluctuations in the price of tin to be subtracted, £2 10s. 11d.; profit for month, £7,759 15s. 4d.; net capital expenditure, £851 6s. 4d. The concentrates in reserve at the 28th of February amounted to 17·33 long tons (2,240 lbs.) of the net value of £1,616; £1,934 0s. 6d. has been included in working costs for the month in respect of shaft sinking, exploration and mine development. Tonnage milled includes 1,058 short tons retreated.

STRUCTURAL FEATURES OF THE WESTERN WITWATERSRAND.—II.

The Roodepoort and Saxon Faults—Features of the Area to the South—The Extension of the Main Reef Series.

Having described the country lying north of the Witpoortje fault, which forms a well defined unit, and is not, in its main features, particularly complicated, Dr. Mellor proceeds to discuss the area lying south of the fault, which, he says, is one of the most obscure on the Rand, owing to its structural peculiarities, and its want of surface relief. Although it has been more or less avoided by geologists it has been largely investigated by those interested in mining, and both surface prospecting and boring operations have been extensively carried out there. The faults which influence the geological structure of the area are first of all referred to.



DIAGRAMMATIC PLAN OF WESTERN RAND FAULTS.

W.R.F. : West Rand Fault.
Rt.F. : Rietfontein Fault.
W.F. : Witpoortje Fault.
Rd.F. : Roodepoort Fault.
Sx.F. : Saxon Fault.
O.G.Q. : Orange Grove Quartzites.
H.H.Q. : Hospital Hill Quartzites.
G.R.S. : Government Reef Series.
J. : Jeppestown Beds.
U.W. : Upper Witwatersrand Group.
Am.D. : Amygdaloidal Diabase.

The Witpoortje Fault.

This fault is first noticeable in the extreme north-west corner of the farm Vogelstruisfontein, where it intersects the course of the Rietfontein fault, as shown in the map recently published in the *S.A. Mining Journal*, and in earlier maps dealing with Dr. Mellor's work. It continues south-westwards, with increasing displacement effects, until beyond Rietvlei, where the relative displacements, though not so marked, are still very great. The course of the fault can be inferred with considerable certainty as far as the northern part of Middelvlei, beyond which it becomes more problematical.

It is a well-known fact and one which comes out very clearly in the detailed mapping of the area, that while the Lower Witwatersrand Beds continue beyond the Witpoortje Fault, and form the wide sweep made by the formation round the neighbourhood of Krugersdorp, a large portion of the same sequence which forms the lower division of the system is also to be found to the south of the fault, coursing across the farms Witpoortje and Rietvlei. With this section of country must also be associated, I think, the outcrops of precisely the same series of beds which run north and south along the eastern side of Middelvlei. The whole thus forms a wide curve analogous to that shown by the formation north of the Witpoortje Fault, except that, over the north-western half of Rietvlei, a portion of the curve is cut out by the fault. This wide sweep of the beds of the Government Reef Series, which is to be seen south of the Witpoortje Fault, is followed also by the Jeppestown Series, and also to a less perfect degree by the beds of the upper division of the Witwatersrand System, including the Main Reef Series on Roodepoort as far as its interruption west of the Princess Mine. The continuation of the greater part of the system in a broad curve to the south of and approximately parallel to the Witpoortje Fault has naturally led to a persistent belief in the extension of the Main Reef Series itself in a south-westerly direction from Roodepoort towards Vlakfontein, [illegible] and Luipaardsvlei. Very extensive and costly prospecting has accordingly been carried out at various times over that area, but without definite result. Nor has this failure to definitely locate the Main Reef Series received, as far as I am aware, any explanation, although it must certainly be regarded as one of the most interesting as well as economically important problems presented by the West Rand area. Before considering possible explanations of the disappearance of the Main Reef Series in this direction, attention must be drawn to certain other points in the structure of the district which may have some bearing on the question.

Folding in the Systems.

Dr. Mellor then refers to the evidence of folding which is to be seen near the south-eastern corner of Vlakfontein, a synclinal and anticlinal fold which affect both the dolomite and the underlying amygdaloidal diabase and Witwatersrand strata, being distinctly apparent.

A very complete basin of dolomite, occupying an area of some four or five square miles and having its centre near the south-eastern corner of Vlakfontein, is a very interesting feature in the local geology. This dolomite basin probably carries a very large water storage, a portion of which is discharged over its margin by two spruits flowing southwards, on Klip Spruit and Doornkop respectively. Its interest in the present connection lies in the evidence it affords of considerable folding in this area, even after the deposition of the Transvaal System. The amygdaloidal diabase which underlies the greater part of the dolomite basin is similarly folded, as are also the Elsburg Beds, upon which the amygdaloid rests, with at least apparent conformity, throughout this district. To the north of the dolomite basin the Elsburg and Kimberley Beds show dips considerably higher than those obtaining further east, a condition which one might expect to be found reflected in the deeper portions of the Main Reef Series also in this neighbourhood. Such steeper dips, however, must again give place at greater depths to considerable flattening. The dolomite basin thus lies in a pronounced synclinal fold, which affects also the Witwatersrand System. To the south of this syncline there is at least one considerable anticline, which is well shown by the disposition of the Elsburg Beds to the south-east of the dolomite basin, its axis running in an east-south-easterly direction across Klipspruit. . . . . . The existence of the various folds just referred to can be readily demonstrated. It will be seen that they must necessarily complicate the outcrops of all the rocks observable in this neighbourhood. This is especially the case with the distribution of the amygdaloidal diabase, which is generally represented as ter-

> minating about the middle of Doornkop, as in the maps of Drs. Hatch and Carrick, or as forming a number of disconnected patches west of that point, and apparently interpreted as portions of an extensive dyke. Its distribution is, however, substantially that shown in the accompanying map, and is perfectly consistent with the observable structural features of the locality. Apart from the bearing which these features have on the economic possibilities of this area, they point to the conclusion that there has been considerable folding of the strata, and that although the Elsburg Beds and the amygdaloidal diabase have been extensively affected by it, their general relationships are the same here as in other adjacent portions of the Rand, and further that although the line of outcrop of the upper portion of the Elsburg Beds and of their junction with the amygdaloid is considerably affected by the local folding, it follows in general the direction of the Witwatersrand System, and partakes in the south westerly bend followed by the whole formation in this locality. From the considerations just mentioned, and from an inspection of the accompanying map, it will be seen that there is good evidence that, south of the Witpoortje Fault, the greater portion of the Witwatersrand System is represented, and that from a line drawn north and south through the middle of the farm Roodepoort the whole formation trends to the south west. . . . .

THE ROODEPOORT FAULT.

It has already been explained in the *S.A. Mining Journal* that Dr. Mellor's discovery of the Roodepoort fault makes it clear how the line of junction between the lower and upper Witwatersrand Systems, at the base of the Main Reef series of beds, is although apparently a normal one, in reality altogether unconformable. As shown in the mapping the Jeppestown beds, as they bend south-westwards, meet successively all the different horizons of the upper Witwatersrand System.

> As it originates on Roodepoort, and is most probably responsible for the cutting off of the Main Reef outcrop on that farm, or immediately west of it, this fault might well be distinguished as the *Roodepoort Fault*, by which name it will be referred to in the remainder of this paper. As already mentioned, the course of the Roodepoort Fault over the greater portion of its extent is very sharply defined and easily traceable. From the termination of the Main Reef outcrops near the western boundary of the farm Roodepoort it passes south-westward just within the area of the old Saxon property, then due west parallel to and just outside the northern boundary of the mynpacht which occupies the middle third of the southern portion of Witpoortje. From near the north-western corner of this mynpacht it turns again to the south-west and continues in this course through the mynpacht on the north-eastern corner of Vlakfontein, and so on to the south-eastern portion of Rietvlei, beyond which its course is doubtful. In his map of the West Rand, Carrick shows a fault crossing the southern portion of Witpoortje, which brings the Lower Division of the Witwatersrand System into contact with the Upper, and which has a similar general direction to a small portion of the Roodepoort Fault, which it would intersect near the north-west corner of the mynpacht referred to, near the southern boundary of Witpoortje. From this point, however, Carrick continues the boundary of the Lower Witwatersrand Beds in a direction nearly due west, then south-west across Rietvlei. This line has apparently been drawn along the outcrop of one of the sandstones of the Jeppestown Series. The southern boundary of that series along the continuation of the Roodepoort Fault is, however, far to the south, in the position indicated in the map. On the south side of the Roodepoort Fault there is a broad belt of Upper Witwatersrand rocks, extending from Roodepoort south-westwards on to Rietvlei. On the southern portion of Witpoortje particularly the whole belt is so shattered as to make a description very difficult. Great diversity of dip, both in direction and degree, is to be seen everywhere, and the absence of any easily recognisable horizons renders the area still more troublesome to deal with. It is very obviously traversed by numbers of minor faults associated with the sharp bend made by the formation, owing to which the beds which strike north-west in the south eastern portion of Roodepoort take a south-westerly direction on the south eastern portion of Witpoortje." . . . .

THE SAXON FAULT.

Among all these minor faults there is one which is more than usually well defined, and which can be traced for a considerable distance :—

> This break is first observable at a point near the extreme northern end of the old Saxon property, whence it passes in a due southerly direction to follow for some distance the valley of the spruit crossing the south eastern corner of Witpoortje. Turning to the south-west the fault passes along the eastern bank of the spruit to the junction with the main stream from Witpoortje, crosses the latter and continues south-westwards across the northern portion of Vlakfontein, where, owing to the deep surface drift, the fault can no longer be followed. This clearly defined break, which may conveniently be referred to as the *Saxon Fault*, is very accurately shown over the greater part of its course on Carrick's map. Dr. Carrick makes this fault a portion of the boundary of the large tract of country, some eleven miles in length, which shows evidence of great disturbance, and does not readily fall into line with the adjacent areas whose structure is more easy to follow. He refers to this tract as an "upthrust section of the Primary Witwatersrand formation, which has been, so to say, 'punched out of the piece' by an upward movement'—a simple but somewhat drastic method of treating this complicated area, with the explanation of which, however, Dr. Carrick's work was not specially concerned. The Saxon Fault is remarkable in that it marks the abrupt termination of the main line of outcrops of the Kimberley and Bird Series of reefs as followed from the Central Rand. Produced a short distance northward across a drift-covered area, it also limits the broken termination of the main outcrop of the Main Reef Series. All these lines of outcrop, in common with that of the whole Upper Witwatersrand System, show a somewhat sharp bend to the north in the neighbourhood of the Saxon Fault, which is in somewhat marked contrast to the general south-westerly bend shown by the same beds, in common with the whole of the rest of the system, about the middle of the farm Roodepoort. The northward trend of the beds as they approach the Saxon Fault appears to be an effect closely connected with that feature, beyond which the south-westerly tendency of the whole formation is again suddenly and very markedly resumed.

MAIN FEATURES OF THIS AREA.

The salient features presented by the Roodepoort fault and the country in its immediate neighbourhood are thus summarised by Dr. Mellor:—

> As already mentioned, the course of the fault is exceedingly clear and sharply defined from the neighbourhood of the Princess Mine on the western portion of Roodepoort, where it probably originates, to the south eastern portion of Rietvlei, whence it probably continues in a southerly direction to be lost under the dolomite on Luipaardsvlei. Over the greater portion of its course the fault brings the easily-weathered shales and sandstones of the Jeppestown Series into contact with the quartzites of the Upper Division of the Witwatersrand System. Although the formation on the south side of the fault is for the most part very much broken by minor faulting, there is good evidence that the Upper Witwatersrand Beds, including the various groups of conglomerates known as the Main Reef, Bird, Kimberley and Elsburg Series, are cut off in succession from below upwards, so that the fault may be said to pass obliquely across the Upper Witwatersrand System, bringing all portions of it successively into contact with the Jeppestown Beds, which lie north of the fault. It finally intersects the amygdaloidal diabase, which is thus also brought into contact with the Lower Witwatersrand System. Near its northern extremity, the Roodepoort Fault is associated with the smaller, and probably younger, Saxon Fault, which intersects or joins it on the western portion of Roodepoort, and which is apparently the immediate cause of the cutting off of the main outcrops of the various reef series traceable from the Central Rand Broken outcrops of all these reefs are to be found, however, beyond the Saxon Fault, striking in a south-westerly direction, and owe their final disappearance to the Roodepoort Fault. . . . .

THE MAIN REEF S.W. OF ROODEPOORT.

The existence of a break of the nature of the Reedepoort fault has obviously a very direct bearing upon the much-discussed question of the continuation of the Main Reef series to the south-west of Roodepoort. Given, in addition to the fault, a dip of the fault plane to the south-east, we have conditions which would tend to carry the lower levels of the Main Reef horizon further and further to the east of the line of strike of the fault, as shown at the surface. Dr. Mellor, however, does not venture upon more than a suggestive remark to this effect.

> The concentration of prospecting operations in the immediate vicinity of the junction of the Jeppestown Beds with the quartzites of the Upper Witwatersrand System points to this junction having been generally regarded as a natural one and situated somewhere near the probable line of outcrop of the Main Reef Series. The junction is, however, distinctly a faulted one, and the general geology of the neighbourhood points to the outcrop of the Main Reef Series being cut off by the Roodepoort Fault. The intersection of the Main Reef horizon with the plane of the Roodepoort Fault, which would determine the limit of the extension of the former, might be expected to occur at an increasing depth as the fault is followed in a south-westerly direction, and would of course largely depend on the character and dip of the fault-plane. From surface considerations the horizon of the Main Reef Series might reasonably be expected to lie at approximately the full thickness of the Upper Witwatersrand System towards the neighbourhood of Rietvlei. We have, however, little information concerning the behaviour of the Roodepoort Fault below the surface, and it appears unlikely that any prospecting operations have been directed towards the acquisition of such data, for although several boreholes have been put down in close proximity to the fault, their position was probably selected with reference to the apparent base of the Upper Witwatersrand System, and with the immediate object of striking the Main Reef horizon. These holes probably gave results very difficult of interpretation unless taken in conjunction with a very complete survey of the surface conditions over a wide area. The investigation of a fault might conceivably be regarded as a matter of purely scientific interest. In this case, however, it is intimately bound up with the main economic question. Should, for example, the plane of the Roodepoort Fault be inclined to the south-east at a very low angle, the complexion of the whole problem would be considerably modified, and among other things the question of the existence of the Main Reef Series on the under side of the fault would require consideration. Before leaving the question of the existence of the Main Reef horizon at a reasonable depth in the district south-west of Roodepoort, it may be said that, taking all the available data into consideration, including such items as the existence of an anticline on Doornkop and the apparent reduction in the thickness of the whole Upper Witwatersrand System in this district, the conditions are more favourable than is now generally supposed to be the case, in consideration of the negative results of much prospecting along the line of the Roodepoort Fault.

MINING ECONOMICS ON THE FAR EAST RAND.

Concise and Interesting Statement from Brakpan Mines—Detailed Mining and Reduction Statistics—Exclusive Use of Machine Drills.

Without being profuse, or overloaded with a lot of unnecessary detail, the reports of the consulting engineer and the general manager of the Brakpan Mines, Ltd., contrive to say all that is necessary to be said in an intelligible and interesting way. With these features of conciseness and adequate information they may serve as models to some more pretentious statements which are prepared regardless of expense, it would seem, as far as statistics of little interest are concerned, but sparing of real useful information.

Machine Stoping.

Among the matters of interest that are referred to by the manager is that of machine stoping, and it is interesting to learn that machines are used exclusively for stoping, only an insignificant percentage of ore having been mined by hand during the twelve months under review. The tonnage mined is segregated as follows:—

	Tons.	Per cent.
From Hand Stoping	512	·069
From Large Machine Stoping ...	419,946	56·895
From Small Machine Stoping ...	250,593	33·951
From Development	67,057	9·085
Total	738,108	100·000

The average stoping width of the ore mined was 66·50 inches, the reef width being a little over 39 inches and the calculated milling width 56·39 inches, on a sorting basis of about 15 per cent. Some 17 inches of waste, therefore, out of a total of 27 inches, roughly, go to the mill in the shape of fines, as a result of the system of machine stoping. The recovery per ton milled amounted, however, to 31s. 2·809d., a figure which is higher than the Rand average for 1912, by nearly 2s. 3d. A useful and interesting piece of information is that the tonnage mined represents the exhaustion of an area equivalent to about 23 claims. Any reference to the claim area which may be regarded as exhausted, in the common way of speaking, is usually avoided at company meetings, and shareholders will doubtless consider this innovation, as it may be called, a precedent that may well be followed as far as possible by the management of other groups.

Mining and Reduction Expenses.

The data relating to mining and reduction expenses are given in greater detail than in the report of any other company on the Rand. They are sufficiently interesting to be quoted at length, as follows:—

The total cost of mining and delivery to the headgear bins, inclusive of development, amounted to £402,976 11s., made up as follows:

	Total cost.			Cost per ton milled.	
				s.	d.
Stoping	£147,623	15	7	4	7·575
Timbering and packing	32,[illegible]32	13	3	1	[illegible]·62
Shovelling and tramming, dump rock	625	8	3	0	0·235
Shovelling and tramming, underground	87,088	17	9	2	8·785
Underground transport	15,411	6	11	0	5·802
Surface transport	1,583	17	2	0	0·596
Winding	27,206	7	4	0	10·243
Pumping	21,293	6	3	0	8·016
Other charges	22,231	14	0	0	8·369
Total, exclusive of development	£355,162	6	6	11	1·703
Development	47,814	4	6	1	6·[illegible]
Total, including development	£402,976	11	0	12	7·703
Sorting and crushing	£12,159	15	1	0	4·578
Stamp milling	27,513	5	2	0	10·357
Tube milling	22,526	3	4	0	8·480
Cyaniding sands	21,614	13	2	0	8·137
Cyaniding slimes	18,704	0	3	0	7·041
Recovery charges	12,367	16	11	0	4·656
Total	£114,885	14	11	3	7·249

Mine Plan.

A general plan of the mine, showing the principal workings and the extent of the development, accompanies the report. It is not a usual appendage to annual statements of this kind, but is one that is greatly appreciated by shareholders. The preparation of such a plan involves no great expense, either in the mine survey office or at the lithographer's, and it is much to be regretted that mining companies generally do not appear to encourage the addition of this means of information. Before concluding these remarks, some reference may be made to the commendable way in which capital expenditure, in excess of working capital, is dissected in the balance sheet. This method of dealing with the subject is not as prevalent as it might be. The general expenses account, also, in the statement of working expenditure and revenue, is given in some detail, and what is usually a vague statement is thus rendered intelligible and straightforward.

Rose Deep.

The report of the Rose Deep for the three months ended the 31st of December embraces the estimated financial position of the company as at the 31st of December, as reflected by the interim balance sheet, working expenditure and revenue account for the quarter, and appropriation account (subject to audit), also particulars of the quarter's development, reduction operations, etc. In the interim (abridged) balance sheet on the credit side sundry assets: Shares, stores, livestock, furniture, sundry debtors and payments in advance stand at £39,624, and cash at bankers, value of gold in transit and investments at £255,747. The liabilities are to sundry creditors on account of dividends, stores, wages, Government tax, etc., £240,774, and the balance brought from appropriation account is £91,130. In working expenditure and revenue account the receipts from gold are £273,707, or 26s. 10d. per ton milled. Working expenditure absorbed £167,514 or 16s. 5d. per ton, which left a working profit of £106,193, or 10s. 5d. per ton. Sundry revenue brought in £296, against which there is a charge for Miners' Phthisis Act Compensation Fund £3,696, making the balance carried to appropriation account £102,793. In the interim appropriation account the balance of working expenditure and revenue account for twelve months totals £442,137. The charges against this sum are Government tax (estimated) twelve months, £37,007: dividend account, declared in June, £157,500, and December, £157,500. The balance of £90,130 is carried to the balance sheet as stated above. The credit balance of appropriation account is not wholly available for distribution. The amount of liability at the commencement of the financial year (£30,456), together with the capital expenditure for the year ended the 31st of December (£5,970), have not yet been appropriated. The final credit balance will not be determined until the balance sheet and accounts as at the 31st of December has been prepared and audited. On development work 3,687 feet were driven, sunk and risen, exclusive of stopes. The reef disclosures were as follows:—Main reef—Distance exposed, 1,167ft.; width, 27in.; assay value, 29s. 10d. Main reef leader—Distance exposed, 1,432ft.; width, 16in; assay value, 39s. 1d. South reef—Distance exposed, 1,417ft.; width, 20ft.; assay value, 28s. 3d. The reduction works crushed and treated 201,000 tons. The value of ore before crushing (as reflected by mill yield and value of pulp) was 27s. 11d. The total yield was 65,092 ozs. fine; the total per ton being 26s. 10d. The development footage for the quarter was 3,687 feet, as compared with 3,775 feet for the previous period. No estimate is given of the payable tonnage developed for the half year, as the annual report, to be issued in April, will give this information for the whole year, together with particulars of the ore reserves on hand. Sand-filling was continued, 17,050 tons being deposited in old workings. The native labour position has remained quite satisfactory. The capital expenditure amounted to £983, leaving a balance of £1,085 still to be expended on authorised work.

Col. Dalrymple has returned to the Rand.

THE WORK OF THE S.A. STANDARDISATION COMMITTEE.

The Sampling of Lime—Determination of Alkalinity.

A pamphlet has been issued representing the continuation of the work of the Standardisation Sub-Committee since June, 1912. A large number of experiments have been undertaken by the members of the committee in order to test the various errors arising when determining the available alkalinity of lime, and it is hoped that the method recommended will be found to yield concordant results in the hands of analysts. The manufacturers in the Transvaal have been consulted, but found themselves unable to render much assistance to the committee.

Inter alia, the pamphlet says:—Lime is put on the market in this country as (a) unslaked lump, i.e., lime direct from the kiln; (b) unslaked ground, i.e., the kiln lime crushed to a powder by suitable machinery; (c) water slaked lime, i.e., lime which has been treated with sufficient water to convert it into calcium hydroxide. The principal uses to which lime is put in this country are as follows:—(a) As a mortar for building purposes. (b) As a raw material in cement manufacture. (c) As a fertilizer in agriculture. (d) For water softening: (1) To neutralise any acid present in boiler feed water; (2) to get rid of temporary hardness by decomposing the acid carbonates present. (e) In gold mine reduction works: (1) To neutralize any acid substances which may be present in the ore or in the water used for milling purposes; (2) to assist in coagulating the slime particles so as to separate them from the fine sand and induce quicker settlement; (3) to protect the cyanide from the action of "latent" acidity in the ore or other injurious agency during treatment. It is apparent that both manufacturer and consumer must see to it that the lime is burned at the proper temperature. In the present state of our knowledge, an accurate practical test for this important property has not been devised. The presence of impurities, more especially carbon, in the limes sent out by manufacturers should be avoided as far as possible. Owing to the fact that the carbon dioxide present in the atmosphere (about ·03 per cent. to ·04 per cent.) unites directly with the oxide (lime) and hydroxide (slaked lime) forming calcium carbonate (the identical substance from which the lime is originally produced), it will be readily understood that access of air should be prevented as far as possible, and that therefore the best method for transportation is in air-tight iron or wooden casks. If transported in bags, they should be of good quality, and if the lime is unslaked, all access of moisture should be prevented owing to the risk of fire, since the union of the oxide with water is accompanied by the evolution of a large amount of heat. These precautions are all the more necessary when handling the lime. There should be no delay in transport.

Methods of Sampling of Lime.

Sampling operations should be carried out under cover, preferably in a shed which can be set aside solely for this purpose. The breaking and quartering operations should be carried out on a clean solid surface that will not break up or mix with the lime or have any action upon it. A good cement or steel surface will be found to meet these requirements. A wooden floor should not be used. The place where the sampling is performed should be removed from all sources of contamination by carbon dioxide and water. The operations of sampling should be carried out as quickly as possible to prevent undue exposure to atmospheric influences.

I.—Unslaked Lump Lime.—When sampling unslaked lump lime put up in bags, containing approximately 200 lbs. each, one of the following two methods may be adopted: (a) Where crushing machines are not available or where it is not desired to crush the lime before use. If the quantity is not less than 10 tons in amount, every twentieth bag is put aside. These are then turned out and crushed until fine enough to pass through a 2 inch linear mesh sieve. The product is then mixed and quartered down three times in the usual manner, until a sample of approximately one-eighth of the original amount has been obtained. This is crushed until it is fine enough to pass through a sieve of ½ inch linear mesh, and the product again mixed and quartered down three times until a sample of approximately one-sixty-fourth of the original amount (or one-eighth of the amount obtained after quartering three times) has been obtained. This product is then crushed until it passes completely through a 30-mesh sieve and reduced by successive quartering until a sample of about 3-4 lbs. weight is obtained, which is spread out evenly on a clean surface. By dipping at regular intervals over the whole surface three amounts sufficient to fill three 4 oz. bottles completely are obtained. Tightly fitting stoppers are then inserted. The above operations may be briefly summarised thus:—First sample, approximate weight x lbs., crushed to pass 2 in. sieve. Second sample, approximate weight x/8 lbs., crushed to pass ½ in. sieve. Third sample, approximate weight x/64 lbs., crushed to pass ⅛ in. sieve. Fourth sample, approximate weight 3-4 lbs., crushed to pass 30 mesh—from this three samples in 4 oz. stoppered bottles. If the original consignment is less than 10 tons in amount, the sample must be taken in the same proportion, namely, not less than 5 per cent. of the whole and at regular intervals over the whole consignment. (b) Where suitable crushing machinery, e.g., a ball mill, is available: The bags, selected as in (a) above, shall be emptied into the crusher, and, as the contents discharge, portions shall be taken with a shovel or scoop at regular intervals. The portions thus abstracted shall not be less than 2 per cent. in weight of the sample crushed, a minimum of 20 portions being taken. These are then thoroughly mixed on a suitable floor and quartered down until a sample of about 3-4 lbs. is obtained, which is then treated as in method (a).

II.—Crushed Lime.—In cases where the lime is delivered in a crushed state, bags are taken at regular intervals, such that the sample obtained represents about 5 per cent. of the whole consignment. Each bag is then dealt with as follows: The contents are emptied on a clean floor and thoroughly mixed as quickly as possible, and, after mixing, a large shovelful is taken and set aside. The portions thus obtained from each bag are then thoroughly mixed and quartered down until the final portion weighs approximately 3-4 lbs., which is then treated as in Ia.

III.—Slaked Lime.—The operations to be carried out in this case are the same as given in II. for crushed lime. Note.—The final samples of about 4 ozs. weight should be enclosed in bottles with tighly fitting dry stoppers or in such other receptacles as will entirely prevent admission of air. Before transmission for analysis, the receptacles must be sealed and securely packed in such a manner that the sample may not be injured in any way during transit.

Determination of "Available Alkalinity" (CaO).

The sample as delivered for analysis is contained in an air-tight vessel, having been passed through a 30 mesh sieve as stated above. It is crushed with a Wedgwood mortar and pestle and the whole passed through a 60-mesh sieve, this operation being performed as quickly as possible. It is then placed in a clean, dry, wide-mouthed bottle fitted with a tight-fitting dry glass stopper so as to prevent any access of air. Two grams of this are carefully weighed out and agitated with 1 litre of a 2 per cent. cane sugar solution (or 1 gram with ½ litre of 2 per cent. sugar solution). If a shaking machine be available, two hours' continuous agitation should be given; if not, six hours' intermittent agitation, every care being taken to prevent coagulation of the lime, in order that the lime and solution may be brought into the most intimate contact during this period. When the agitation is finished, the solution is filtered as quickly as possible and aliquot portions titrated with N/10 or N/5 acid, using rosolic acid as indicator, avoiding delay, so as to obviate undue exposure to the atmosphere. Note.—The distilled water used in the above determination must be made neutral to rosolic acid to counteract the presence of dissolved CO_2.

SLIME DECANTATION: THE CONTINUOUS METHOD.

Modification of an Old Process—Some North American Installations Described—A Process of Peculiar Interest to the Witwatersrand.

The dawn of yet another epoch in the history of the cyanidation of gold ores seems to be engrossing the attention of the metallurgical world. In this instance it is not a new process that is claiming attention, and perhaps for the very reason that it is not new it is being given very thorough and expert consideration. There have been so many new and novel methods of recovering gold from ore launched of recent years and so many of these have been consigned to the realms of the impracticable and the unprofitable that it is not to be wondered at that the advent of some entirely new method is not regarded with much excitement nowadays. We have in previous issues referred to the revival of the old slime decantation process. In our issue of February 15th last we remarked that for some time, and quite irrespective of the famous "Moore" judgment, many cyanide metallurgists have been dissatisfied with filter processes, owing to the high cost of installation and operation, and have proposed, and in some cases adopted, the decantation system once more. It was further stated that such plants as have been erected recently on the old principle, employ a very different process from the original decantation, and, in fact employ the continuous process involving successive thickenings and dilutions, a number of strengths of solutions being used, the lowest being extremely dilute and practically barren. Where water is plentiful and where weak solutions can be used, it is possible to employ the continuous decantation process without filters, but where stronger solutions are required, as is the case with silver ores, the filter must be used as an accessory. We have also ventured the prophesy that in the next new treatment plants to be erected on the Witwatersrand slime thickening machines will be prominent features. It should, therefore, be of considerable interest to learn something of the latest practice in this direction as carried out at some of the new mills of North America. The salient principle of the method is that it is a development of the old slime decantation system of cyanidation whereby the process is continuous through thickening machines. The flow of solution is opposite to the direction of pulp movement and precipitation is accomplished at any desired point. The solution is passed over two or more different pulps before being precipitated in order to concentrate the metal in small solution volume. In the issue of our American contemporary, the *Engineering and Mining Journal*, of New York, to hand by last mail there appears a lucid and highly interesting article on the continuous decantation of slime by Mr. Herbert A. Megraw. Mr. Megraw in the course of his paper remarks:—

In the days when the decantation method of treating slime was the only one known, operators made serious efforts to improve it, particularly to find some way of avoiding the losses which occurred in discharging residues containing moisture charged with both cyanide and valuable metal in dissolved form. The necessity for improvement brought for the slime filters, and for a long time experiments in decantation were discontinued. After many years of filtering, however, the suspicion remains that the decantation process might be improved so as to compete with filtration, the cost of operation and maintenance of existing filtering apparatus going for toward strengthening that suspicion. It may be said that the cost of slime filtration varies from 10s. to maximum figures which would be regarded with suspicion were I to mention them. Including cost of operation, maintenance and loss in dissolved metal, the minimum figure above mentioned is extremely low and I doubt whether there are any number of plants in existence attaining it. It will be seen that there is, then, an opportunity for improvement, for if any procedure can successfully reduce these costs or losses, or even equal them without the use of complicated and expensive machinery, it will stand a good chance for approval and success.

Proposed System of Continuous Decantation

Lately some progress has been made toward developing a process of continuous decantations, which is nothing new but a development of the methods used before the filters came into use. In the old intermittent decantation process the slime after being agitated with a quantity of solution was allowed to settle, the solution decanted off and a new bath of solution put on. This was in turn agitated, allowed to settle and again decanted, the process being carried on as many times as was thought necessary. The efficiency of fresh solution washes was recognized, particularly when this solution was barren or freshly made up or regenerated, but the difficulty with this system was the enormous quantities of solution to be handled in addition to the impossibility of reducing the moisture content of the final pulp to such a point that too much dissolved metal and valuable cyanide should not be thrown away. This new development attempts to accomplish a solution of both difficulties by means of a continuous-decantation and thickening process using solutions flowing opposite to the course of the pulp. The fact that this method has seemed feasible to a number of competent metallurgists and is actually in operation in a number of instances makes it worthy of attention and in this paper two such plants will be described.

Ores Milled in Cyanide Solution.

The plants in question are the mills of the Ophir Gold Mines, Milling and Power Co., at Ophir, San Miguel County, Colorado, and of the Blue Flag Gold Mining Co., in the Cripple Creek district. Both are of recent construction, and while operations have not been carried on long enough to provide satisfactory details of cost and maintenance, the metallurgy has shown sufficient promise of success to warrant consideration. The Ophir mill crushes ore with stamps, the installation including 20 or 850 lbs. each with 6-in. drop and 104 drops per min. From the stamps the pulp goes to a Dorr classifier, where the slime is passed to a Dorr thickener and the sand reground in a Hardinge mill, from which it is pumped back to the classifier, the circuit being closed and only solids of sufficient fineness reaching the thickener. A point of interest is that the overflow solution from the first thickener is the only one precipitated. It is passed through a clarifier and precipitated with zinc dust. The thickened pulp is passed to two agitation tanks of the Dorr type through which it passes in series and where it is calculated that the extraction is practically completed. Leaving the agitators, the pulp is delivered to the first of a series of four thickeners, through which it passes with successive dilutions until it is finally discharged from the last one, washed practically free of gold in solution. The overflow solution from the first of these thickeners is returned to the mill solution tank, where it is used in milling and classifying, the result being a concentrated solution for precipitation. The barren solution from precipitation goes to dilute the inflow into the second thickener, the overflow from which goes back into the first. The accompanying flow sheet shows the movement of pulp and solution throughout the mill. It will be noted that water is taken into circulation at the end of the washing period, the logical point of entry for it, and practically replaces the solution which comes with the solids to that point.

Solutions Progress Contrary to Pulp.

It will also be noticed that the progress of solutions is contrary to the direction of pulp flow, the solutions being constantly enriched. The figures given in the flow sheet are based on ore carrying $5 in gold and the contents of solutions are given in pounds of KCN and lime. The calculations of thickening are based on withdrawing a pulp from each thickener which consists of half solids and half solution. This is accomplished in practice, in fact a slightly thicker pulp can be obtained, thus increasing the efficiency of the process. It has been in operation only a short time but the results obtained have been in complete accordance with the figures shown. It will be seen that the installation is simple and inexpensive, may be operated by a minimum amount of labour and accomplishes a washing of pulp and removal of dissolved metals that is, to say the least, comparable with good filtration work. The lime in this mill is added at the bins and goes through the circulation with the pulp. The consumption amounts to about 0·9 lb. per ton of ore. The value of the process depends a great deal on using solutions of low cyanide content and the existence of a plentiful water supply, which conditions are satisfactorily met in this case.

The Cripple Creek Installation.

The Blue Flag mill is situated between Cripple Creek and Victor in Colorado. The ore averages between $5 and $6 and is to a great extent from the dumps. The coarse ore is dumped on to a steel conveying and picking belt where a portion of the barren rock is removed. From the picking belt it is passed through a 12 x 18in. Dodge crusher and through a Symons disk crusher from which it emerges reduced to about ⅜in. cubes. The finely crushed ore is then delivered to a special form of chilean mill which consists of a concave die ring 7ft. in diameter, over which convex rollers pass. The rollers are small, weighing only 700 to 800 lbs. each. The mill makes 36 r.p.m. and grinds the ore, in cyanide solution of 1½ lbs. per ton strength, through a 30-mesh screen. Solution is used at the rate of about five to one. The pulp as it comes from the mills is delivered to the series of agitating tanks through which it passes continuously. These tanks are 14ft. diameter and 16ft. deep, having cone bottoms at an angle of 55°. The agitation is pneumatic, elevating the pulp through a central tube. This point in the process is open to criticism, as the pulp from the mills is in too coarse condition for economical agitation, to say nothing of the metallurgy of it. If it is true that finer crushing is not necessary, then it would seem reasonable to separate the coarse portion of the solids and treat it separately by some more economical means. The pulp undergoing agitation has the following approximate grading analysis: On 30 mesh, 0 to 0·5 per cent.; on 40 mesh, 4 to 9 per cent.; on 60 mesh, 22 to 24 per cent.; on 80 mesh, 35 to 36 per cent.; on 120 mesh, 58 to 60 per cent.; and through 120 mesh, 40 to 42 per cent. The grading statement is cumulative. Pulp of this class requires excessive power to keep it in circulation.

Washing in Continuous Thickeners.

The pulp is in circulation through the agitation tanks for about nine hours and the extraction in them amounts to about 70 per cent. In considering the extraction results it must be remembered that this is on the refractory ore of the Cripple Creek district. The cyanide consumed in the process is about 0·35 lb., of which 0·15 lb. is mechanical loss. Lime is added to the ore bins and progresses with the pulp, the consumption being about 2½ lbs. per ton milled. The pulp from the agitators is taken to a series of four thickeners and is washed through them after the manner described in the Ophir mill. The accompanying diagram shows the flow of pulp and solutions through them. In the case of the Blue Flag mill, also, it has been found possible to secure a thickened pulp containing less than 50 per cent. moisture. In this instance, also, it has been found that the calculations, based on 50 per cent. thickening, are borne out in practice.

Other Combinations Possible.

It should be remembered that this development is not recommended to cure all the ills that cyaniders are heir to, but is a progression along conservative lines and one that should eventually lead to a fixed system available in cases where the character of the ore will bear such treatment and where other local conditions are favourable. It is a system which, while not yet perfected, will be well worth following. It is easy to see that other combinations are possible, such as using a greater number of thickeners, of this type or any other satisfactory one, and by precipitating two or more different solutions. The two installations mentioned are not by any means the only ones using it. They may not even be the ones where it is most advanced, the idea in presenting the matter being principally to draw attention to the fact that there is a system in course of development which may possibly lead to decided economies in the cases of ore to which it is applicable.

THE POSITION OF THE TRANSVAAL COAL TRUST.

Coal Interests Reviewed.

During the year 1912 the directors of the Transvaal Coal Trust purchased a one-sixth undivided interest, in extent 1,473 acres, in the coal rights of the farm Vaalbank No. 228, Carolina district, and acquired the prospecting rights over the undermentioned properties in the district of Breyten, with the right to purchase the coal rights:—Smutsoog No. 143, Ermelo district, in extent 9,801·511 acres; Bankfontein No. 14, in extent 385·203 acres; Klipfontein No. 144, in extent 3,246·711 acres; Vaalbank (portion) No. 228, Carolina district, in extent 6,260·607 acres. Prospecting work is now being actively carried on with a view to determining the value of the coal deposits. The amount standing to the debit of property account has been reduced by the transfer of £7,500 of the debit of Brakpan Township, representing the value of surface rights of that portion of the farm Weltevreden on which the township is situated.

Brakpan Township.—The number of the company's stands sold since the formation of the township is 196, of which 150 were business and 46 residential stands The total sum accruing in respect of these stands amounts to £35,891 10s., but owing to many of the sales having been made on the instalment system only £15,543 8s. 2d. has so far been received. The amount standing to the debit of the township account in the balance sheet is arrived at after debiting the account with all preliminary expenses, as well as the value placed upon that portion of the land upon which the township is situated, less the amount received from sales.

Coal Winning.—The profit derived from the sale of coal amounted to £38,863 4s. 4d., less a sum of £483 18s. 5d. in respect of Government profits tax, or a shortfall of £11,043 as compared with 1911. This is in the main due to the decrease in the profit from De Rietfontein Colliery. The output from the collieries, which amounted to 466,442 tons, was dealt with through the Transvaal Coal Owners' Association (1910), Ltd. During the year the agreement under which the Coal Owners' Association was formed, and which expires on June 30th next, was renewed for a period of five years to June 30th, 1918.

De Rietfontein Colliery.—The output from this pit for the year amounted to 141.840 tons, a decrease of 50,036 tons as compared with 1911. The considerably reduced demand for coal from the Springs district during the last few months, caused by the new railway rates being more in favour of coal from the Witbank area, combined with a falling off in the quality of the product at De Rietfontein, were responsible for the decrease. These factors have further reduced the life of the colliery, and in all probability coal winning will shortly be discontinued.

Oogies Colliery.—The output amounted to 324,602 tons, being an increase of 19,109 tons as compared with the figures for 1911. In view of the approaching suspension of operations at De Rietfontein Colliery, certain additions and alterations to machinery and plant are in progress at Oogies Colliery in order that the combined allotment may be dealt with at the latter pit.

Accounts and Finance.—The amount of capital expenditure at the De Rietfontein Colliery during the year was £250 14s. 1d., unavoidable extensions to mine buildings being responsible for the outlay. The sum expended under the same head at Oogies Colliery was £11,868 1s. 8d., the chief items being a new Riedler compressor, a 250 n.h.p. Stirling boiler, coal cutting machinery, and extensions to the screening plant and air pipe line. The finances of the company have been considerably strengthened by the dividends accruing on its shareholdings in Brakpan Mines, Ltd. The directors recommend that the following interim dividends, which they have already paid, be declared the dividend for the year 1912: No. 25 of 7½ per cent. (1s. 6d. per share), £40,932; No. 26 of 12½ per cent. (2s. 6d. per share), £68,220.

MINING PROGRESS IN MANICALAND.

Points from the Official Quarterly Review of the Director of Mines.

The value of the gold output during the last quarter of the year 1912 has shown a heavy decrease as compared with the previous quarter. This diminution, however, has been due to a merely temporary cause, namely, to the suspension of all crushing operations on the Bragança Mine during the period of construction of the new concentration and cyanide plant that has lately been erected on that mine. Now that the installation of the Wilfley tables and the tanks for cyanide treatment on the Bragança are completed, an increased output from this mine may be confidently expected. Permanent full-month crushings with the full complement of stamps of this mine will not commence until the beginning of the second half of 1913, but in the meantime crushing will take place during some of the months of the first half of 1913 or during a portion of some or all of these months. An improved quarterly output for the first quarter of 1913 may therefore be awaited with some confidence. The smaller propositions, taken by themselves, show an increased output on that of the third quarter of the past year, the production for December of the Chimezi-Rhodes-Banket Mine, belonging to Mr. Dias Pereira, being 72 ounces. On the Bragança, on the 120 feet level, the development footage at the end of December showed a total of 679 feet driven on the reef or some 214 feet for the quarter under review. The sinking of the main shaft has also been continued, and it has now reached a depth of some 240 feet, at which depth it is intended to lay out a second level. As the reef continues to be to the north of the shaft between the 120 and 240 feet levels, in the same manner as between the surface and the 120 feet level, a crosscut will have to be driven at the 240 feet level from the shaft to the point of intersection with the reef. On the Guy Fawkes Mine the work of unwatering and repairing the shaft has been continued, and at the termination of the year 1912 the shaft and fifth level were unwatered and the sixth level partly so. This work is being carried out by the proprietors of the mine, the Moçambique Macequece, Ltd., preparatory to handing over the mine on option to Mr. Charles Aubert, on the terms of an agreement made between this gentleman and the Moçambique Macequece, Ltd. In addition to the unwatering of the shaft, a considerable amount of general repairing work has been done by the option holders with the consent of the Moçambique Macequece on different sections of the mine, so that on taking over the property the option holders may be in a position to at once commence mining operations.

During the quarter under review the Welcome block of claims and most of the other adjoining blocks that formerly belonged to Mr. Whyte, of Durban, have been bought at public auction or repegged by Mr. J. Aguas and Dr. [illegible], of Beira. As Mr. Aguas had already purchased from the former owner of the claims the machinery erected thereon, including the 5-stamp 1,350lb. battery, and a Tangye's gas engine, crushing will be commenced early in next quarter. Mining work on the Welcome property has already been begun, and a certain number of tons of ore extracted. The prospecting of the Revue alluvials was continued during the quarter up to approximately the beginning of December, as the unusually dry weather that prevailed until the end of December allowed of alluvial prospecting being continued to a later date than would be usually practicable. The representative of the Andrada Mines has expressed himself as satisfied with the results of the season's work, and a portion of the plant for the construction of the power line to be erected between the Inhamucarara Valley and the Revue has already been received. The race in the Inhamucarara Valley, which has a total length of some four kilometres, has been completed, and the course of the future power-line surveyed and mapped out. Alluvial prospecting work has now been temporarily suspended until the end of the wet season, but in the meantime the erection of the Inhamucarara generating station and of the power transmission line will be energetically pushed forward, so that the projected commencement of dredging operations in the last quarter of 1913 may not be retarded.

THE YEAR WITH BRAKPAN MINES.

Profit Earned, £444,117—Forty per cent. in Dividends.

From the annual report of the Brakpan Mines, to be submitted at the tenth annual meeting at the Corner House, on May 27th, we learn that the company's holdings remain the same as at the date of the last report, and consist of: Mynpacht No. 490/1899, in extent 405·754 acres, equal to 276·06 claims; Mynpacht No. 543/1906, in extent 888·936 acres, equal to 604·80 claims; claims on farm Weltevreden, No. 16, 68·00; claims on farm Benoni No. 10, with coal rights on 73·326 claims, 201·59 claims; total, 1,150·45 claims, as well as three stands on farm Benoni No. 10. The profit from operations for the year amounted to £444,117 2s. 9d.; add interest, dividend on shareholding, and sundry revenue, £2,213 19s. 1d.—£446,331 1s. 10d.; from which must be deducted depreciation and contributions to Miners' Phthisis Insurance and Compensation Funds, £3,595 19s. 1d.; leaving a net balance of revenue over expenditure of £442,735 2s. 9d.; add balance to credit of appropriation account at December 31, 1911, £370 1s., making a total available credit of £443,105 3s. 9d.; against which the following amounts have been appropriated: Expenditure on capital account, £48,728 4s. 7d.; excess development, £1,332 9s. 7d.; Government tax on profits, £41,953 11s.; dividends No. 1 and No. 2 (40 per cent.), £300,000—£392,014 5s. 2d.; balance unappropriated as at December 31, 1912, £51,090 18s. 7d. In accordance with the policy foreshadowed by the chairman at the last annual meeting, all capital expenditure incurred during the year has been provided for by appropriating a portion of the profits earned. Of the amount appropriated under this head, the sum of £29,726 was in respect of the original equipment, the balance being in connection with certain additions to plant found necessary in the light of further experience. During the year the groups decided to merge their private recruiting organisations into a general body, known as the Native Recruiting Corporation, Ltd. The company joined the new corporation and acquired the necessary number of shares. The item Native Recruiting Organisation (Consolidated Mines Selection Group of Mines) will therefore disappear from the next financial statements. The company's shareholding in the Witwatersrand Co-operative Smelting Works has been reduced from 1,950 shares to 1,219. Two dividends have been declared during the year, viz.: No. 1 of 15 per cent. on the issued capital of £750,000, absorbing £112,500; No. 2 of 25 per cent. on the issued capital of £750,000, absorbing £187,500.

The Consolidated Mines Selection Company, Ltd., shows a net profit for the past year of £69,276. A dividend of 10 per cent. was declared. The sum of £15,000 was placed to the reserve, and £10,623 carried forward.

CHARTERED ANNUAL REPORT.

New Settlers and Agricultural Prospects—The Outlook in Regard to Mining.

SOUTHERN RHODESIA.

The administrative revenue for the year ended March 31, 1912, showed increases under all heads. The receipts for this period amounted to £808,602, and there was an accumulated surplus from previous years of £56,289. The administrative expenditure during the year amounted to £837,805, but customs revenue has received a check, but Sir William Milton reports that "in the opinion of those qualified to judge, the set-back that has occurred is purely temporary.'

Natives on Bicycles.

The general condition of the native population is satisfactory. The natives show greater disposition to work, and employers are paying far more attention to their well being. The number of the native population increased from 487,000 in 1901 to 700,000 in 1911, and evidence of their advance in material prosperity is to be found in the very large increase in the numbers of their stock, and the growing demand for European articles, as well as by the extent to which they use the post office, the telegraph and the railways. Railway travelling has become very popular among them, and they spend their money freely upon it. The receipts from this source represent about 90 per cent. of the third-class fares. The number of natives travelling on the Rhodesian railways during the year ended September last is estimated at 190,000. It is interesting to note that 915 licences for bicycles have been taken out to date by natives in the township of Bulawayo. Sir William Milton's reports show that, notwithstanding the shortage of grain, the payment of taxes has been even more complete and punctual than in previous years, proving that the native population is now possessed of resources upon which they can fall back in time of need. The Agricultural Department is now highly organised and efficient upon both its scientific and advisory sides. A comprehensive programme of road improvement and extension has been carried out during the past year. The greatly increased use of motor transport during the past few years has, in many respects, revolutionised the conditions of existence. Importance is attached to the gradual extension of the telephone to rural districts.

Commercial.

The commercial undertaking of the company has now reached a new and important stage. The first care of the Board after Rhodesia had been occupied and its administration constituted was to construct the trunk railways, without which trade and industry could not develop, and to assist private enterprise so far as the Company could afford to do so. This assistance mainly took the form of grants of land to settlers and companies, and of subscriptions to the capitals of mining concerns. By the year 1910 this policy had fulfilled its objects. The Administration of Southern Rhodesia and the railways had become self-supporting. The mining industry had made itself, to a large extent, independent of the Company's financial assistance, and the directors were at length able to devote greatly increased attention to problems of land development. The Rhodesia Land Bank is now making loans to farmers on approved security.

Settlers.

The number of new settlers established on the land by the Land Settlement Department during the year ended March 31, 1912, was 768 men, women and children, bringing with them capital to the amount of £283,399, or approximately £970 per family, as against 469 men, women and children, bringing capital to the amount of £158,135, or £832 per family in the previous year. During the six months ended September 30, 1912, 356 new settlers arrived, with an estimated capital of £126,154, or approximately £1,433 per family. These figures by no means represent the total numbers of new settlers during the periods in question.

Rise in Land Values.

Rhodesia has now reached a state of development at which land values are not only rising generally, but are susceptible of wide differentiation according to soil, possibilities of irrigation, and accessibility to markets. In the past the policy of the Company was to sell land at a low and fairly uniform price, partly because the country was not sufficiently developed to admit of much differentiation, and partly to encourage settlement. The principle of valuation will be applied in futuro to all sales, and every holding will be sold on its merits at a price to be determined after expert examination. The selected estates which the Company is working for profit on its own account now constitute an important branch of its operations. The improvement in values and conditions has also extended to Northern Rhodesia, where similar causes have been at work.

Mining—Record Outputs.

The outputs of gold, coal and chrome iron have exceeded all previous records, and farther increases in all these directions are anticipated during the present year. The development of the gold mines has been actively pushed on, and the stability of the industry is assured for many years. In the list of gold-producing countries in the British Empire, Rhodesia now stands third. The returns for the year ended December, 1912, with the exception of silver, establish a record. The output was: Gold, £2,707,369; silver, 176,532 oz.; coal, 216,140 tons; chrome iron, 69,260 tons. Gold mining continues to be the principal industry of the country. The interim report of the Mining Department draws attention to a recent increase in the number of small workers. In the early period of the nine months under review the number was approximately 155 per month, but in the last three months 184 producers per month were recorded. The output of copper matter in Northern Rhodesia from the Silver King and Sable Antelope Mines for the twelve months ending March 31, 1912, was 1,582 short tons of an estimated value of £57,170. From the Kansanshi copper mine 2,454 tons of copper have been produced to date. The efficient condition of the railway system of the territory continues to be one of the most satisfactory features of Rhodesian development. The following are the comparative figures of railway receipts for the last five years :—

Year ended Dec. 31.	Gross Receipts of Rhodesia, Mashonaland, and Beira Railways.	Net Receipts of Rhodesia and Mashonaland Railways.
	£	£
1908	848,426	353,168
1909	1,086,778	514,906
1910	1,356,289	700,962
1911	1,736,670	958,406
1912	1,654,376	825,940

Sound Condition of the Mining Industry.

The mining industry has never previously been in such a sound condition, nor have its prospects ever been so hopeful. Record outputs have been shown by the gold mining and other principal departments of the industry, and it is satisfactory to realise that these returns, excellent as they are, are small in comparison with the results that will be secured when crushing begins at the Shamva, Cam and Motor, Eileen Alannah, Falcon, Planet Arcturus, and other gold mines for which the equipment has already been ordered.

Diamonds in Banket.

Mr. A. C. Hall presided at the meeting of the Geological Society, held this week at the Chamber of Mines, when Professor R. B. Young, M.A., B.Sc., read a paper on "Diamonds in the Banket." According to Mr. J. Ballot, two diamonds were found in 1889 in the mortar-boxes of the Wolhuter G.M. and Percy G.M., and the stone from the latter mine was described by Mr. Ballot, who had it in his possession, as being of a light green colour. A considerable number of diamonds had also been discovered at Klerksdorp, from the Gold Estates Reef, Elsberg series, a body which was advertised in the name of a company that worked the reef—namely, the Klerksdorp Gold and Diamond Mining Co., Ltd. Some weeks ago, said Professor Young, a diamond was found in the black sands from the mortar-boxes of the Modderfontein G.M. by A. C. Laurie, at present a student in the S.A. School of Mines and Technology. The stone was about three-quarters of a carat, and was of a light greyish olive-green colour. This, as far as the speaker knew, was the third diamond recorded as having been found from the Main Reef series. It was a noteworthy fact that the colour, when stated, of the diamonds found, was invariably green. It might be considered certain, he said, that diamonds in the banket were deposited with the pebbles during sedimentation, and that occurrence was interesting, as it proved there existed a series of diamonds in the pre-Witwatersrand rocks. Concluding, Professor Young said that black sands from the mortar-boxes were worthy of careful examination, as already there had been discovered in them iridosmine, gold telluride, and diamonds, all of which occurred in such small quantities that probably their presence would have been undiscovered had it not been for careful watching.

The Rhodesian "Government Gazette" contains a draft Ordinance to prohibit the employment underground of persons suffering from miners' phthisis, which Ordinance it is proposed to introduce during the forthcoming session of the Legislative Council. The Ordinance enacts that the Administrator may authorise a practitioner to go upon a mine for the purpose of examining the persons employed underground. The penalty for contravention of the Ordinance, or obstructing the medical practitioner, is fixed at a fine not exceeding £100; in default, imprisonment, with or without hard labour, for a period not exceeding six months.

RAND AND PANAMA HEALTH CONDITIONS COMPARED.

Mr. Samuel Evans Recounts His Impressions.

In an interview with a London paper, Mr. S. Evans says, *inter alia* :—

Perhaps the most important lesson which the Rand, South Africa, and, indeed, the rest of the world has to learn from what the Americans are doing in the Panama is in connection with health matters. The Department of Sanitation of the Isthmian Canal Commission was organised by, and has from the outset been under the direction of, Colonel Gorgas. Colonel Gorgas reminds me of the late Sir Julius Wernher. He combines much shrewdness and great ability with a charming manner, and is, as one writer says, "so naturally quiet and reserved in demeanour and deportment that men, accustomed to measure a man by bluster and self-assertiveness, make the mistake of assuming that he is not strong." It would take too long to refer in detail to the wonderful sanitary work which has been accomplished on the Isthmus. I shall try and do that on another occasion. Owing to the climatic conditions, it is infinitely more difficult to make and keep the Isthmus of Panama healthy than is the case on the Rand. It is raining pretty constantly on the Canal zone during nine out of the twelve months. Even their dry season is wetter than the Rand wet season. The temperature never falls below 61 deg., and it is warm enough for mosquitoes and flies to breed all through the year. The workers on the Canal, particularly the negroes, are not half so much under the control of the doctors as Kaffirs are on the Rand. We house and feed our Kaffir employees and attempt to get them to clothe themselves properly. Of the 38,000 West Indian negroes on the pay-roll of the Isthmian Canal Commission, less than 2,000 feed at the Commission kitchens, and only about 6,000 sleep in the quarters provided by the Commission. The rest look after themselves, doing just as they like as regards what they eat and where they sleep. Many sleep in the towns and villages, in small, stuffy back-to-back rooms. Let it not be thought that the Panama Canal doctors approve of all this; they don't, but they recognise that it is less important to have good ventilation than it is to prevent a healthy person from being bitten by a mosquito, carrying yellow fever germs, or by a flea carrying plague germs. One of the doctors said to me: "You cannot force a community to do all the things it should do; the great thing is to get it to attend, at any rate, to the most important of these things." The Commission do not interfere in any way with the clothing. On the Rand all tropical natives are compelled to use change-houses and to put on dry clothes when they come out of the mines. Although they are constantly getting their clothes wet, the West Indian negroes are not provided by the Commission with means of drying their clothes. Some years ago an attempt was made to induce the West Indians to use drying houses, but the experiment proved a failure. Altogether I believe that there would be a disposition on the Rand to condemn the Panama Canal system as being much too weak in certain directions. The proof of the pudding, however, is in the eating, and, judged by the results, the Panama Canal system is the best in the world. I should not say that there is so very much difference in the views of the medical advisers of the mines and of the men who are responsible for the sanitation of the Panama Canal. Both parties are probably, on the whole, in accord as to the sanitary measures which should be adopted by any community; they differ only as to the relative importance of these measures. The Isthmian Canal Sanitation Department was established mainly to fight insect-borne diseases, notably by destroying the insects and their breeding places. That is the main thing which is done on the Canal and is not done to any serious extent on the Rand. The essence of the building laws in force on the Isthmus is this: A house must be (1) rat proof, so that fleas may not bring plague into it, and (2) there must be no places where water and rubbish can accumulate, and thereby provide hatcheries for mosquitoes and flies which may spread yellow fever, malaria, and typhoid. Then again, Panama sanitarians have not much faith in methods and machinery which are not fool proof. That is why they have replaced the pail system, which was in vogue in the time of the French Canal companies, by closed pit closets or by water closets. They argue that perfect handling must not be expected; people must take it for granted that there will occasionally be careless handling, and that pails will be upset or left with their lids off so that flies can feast on their contents and then proceed to do their ablutions on the bib of a baby in a white household. The French Panama Canal companies installed the pail system to deal with night soil pretty much as we have done on the mines of the Rand. The Americans set their faces against this system from the first, and they only permit pails to be used now where closed pit closets and water closets cannot be installed, such as on the locks and on the water sheds, from which drinking water is obtained. My visit to the Panama has confirmed me in the view I have long held that a grave responsibility rests on the shoulders of the Chairman and members of the Health Committee of the Johannesburg Town Council in connection with the maintenance of the pail system on the mines in the Municipality. Dr. Porter, M.O.H., in one of the first reports he wrote after his arrival in South Africa, strongly recommended the replacement of the pail system by a water-borne system. Unfortunately his advice was not followed with any enthusiasm, largely, I am afraid, because of the enormous profits which the Town Council were making out of the pail system.

THE POSITION OF THE ROBERTS VICTOR DIAMONDS.

Year's Profit £26,212—Points from the Reports.

From the annual report of the directors of Roberts Victor Diamonds, Ltd., we learn that the lease of the Government's share of the profits in the mine expired on December 31, 1912. During the year extensions of the area were opened up and worked, proportionately increasing the rental paid under the lease. The Government have agreed to enter into a lease for a further period of three years. During the year the remainder of the blue ground from the mine which had been floored in 1911 for treatment, totalling 22,830 tons, was washed. The washing of yellow ground from the No. 1 and No. 2 areas was continued during the year. The open workings of these areas have now been connected. The fissure has been proved to be continuous and has been opened up by the removal of overburden over the whole length, which now measures 1,000 feet. The fissure ground opened up during the year has more than doubled the claim area, which now amounts to 50·3 claims. Exploratory work is being continued.

The forecast made in the directors' last annual report, that sufficient yellow ground could be extracted from the No. 1 and No. 2 areas to enable the company to carry on washing operations for twelve months at least, has been more than fulfilled, and the possibility foreshadowed in the same paragraph of further ground being opened up has been realised. In order that open cast workings may not be interfered with by premature falls of ground, every possible risk is being eliminated by the removal of reef. At the same time, the directors consider that the area of the fissure proved in the No. 1 and No. 2 areas has now a very important bearing on the future of the mine.

The total quantity of yellow ground from No. 1 and No. 2 areas hauled and washed during the year was 195,532 loads, which, with the 22,830 loads of blue ground washed from the mine in the early part of the year, makes a total of 218,362 loads washed. The recoveries of diamonds were 72,490 carats, or an average of 33.1 carats per 100 loads. Washing proceeded continuously throughout the year, with the exception of a period of three weeks in December, when washing was discontinued to allow of the removal of reef, to make the workings secure before the rains set in. The average cost of mining, hauling and washing during the year has been 4s. 4d. per load washed; included in this cost is the haulage and removal of reef.

DIAMONDS SOLD IN SOUTH AFRICA.

The 72,490 carats of diamonds recovered during the year have been sold in South Africa for the sum of £77,023 13s. 10d., equivalent to £1 1s. 3d. per carat, including the fine sand. The market for the company's goods during the year has been good, reflecting the strong demand that has existed in London in the diamond market. The selling of the company's output in London was discontinued in June, 1911, and since that date all sales have been made in South Africa at satisfactory prices. The prospects of prices for the current year continue to be good. The working revenue and expenditure for the past year shows on the credit side: Diamonds sold, less cost of realisation and diamonds on hand at valuation, £76,088 8s.; farm rents, etc., £119; total, £76,207 8s.; and on the debit side: Mine working expenses, £7,285 13s. 10d.; Johannesburg office expenses, directors' fees and general expenses, £1,931 8s.; London office expenses, £146 11s. 3d.; interest charges, £631 14s. 1d.—£49,995 7s. 2d.; leaving a profit for the year of £26,212 0s. 10d. The appropriation account shows against this profit: Loss as per balance sheet, £12,617 16s. 8d.; depreciation on furniture at head office, £141 16s. 9d.; total, £12,759 13s. 5d.; leaving a balance to the credit of profit and loss as shown in the balance sheet of £13,452 7s. 5d. The loans, which stood at

£30,715 7s. 11d. at December 31, 1911, have been paid off during the year. The machinery, plant and equipment, costing altogether £160,083 15s. 7d., have been written down by appropriation of profits to £9,883 2s. 2d.

ENGINEER'S REPORT.

The consulting engineer states that in the early part of January, 1912, the extraction of the blue ground which was available above the 314 feet level was completed. Arrangements were made for the protection of the development shaft and the workings below the 314 feet level. The No. 1 shaft, the main tunnel into the mine, and the connection to the air shaft at the 314 feet level, together with the other underground workings, have been carefully maintained in readiness for the resumption of mining work. The flow of water from the development work below the 314 feet level continues at about the same rate as when mining operations were suspended, viz., about 7,000 gallons per hour. *Areas No. 1 and* 2.—During the period under review the work of opening up this section of the property has proceeded vigorously, and the fissure has been proved to extend continuously through the two areas, that is, over a length of about 1,000 feet. The fissure, throughout the length exposed, has maintained a workable width; the variation in width is considerable, ranging from about ten to one hundred and ten feet. The survey which has just been completed shows the area of yellow ground now exposed to be 50.3 claims, an increase of 26.1 claims over that proved at the end of the previous year. A small section of the ground has been worked down to the 110 feet level, the remaining portions to various depths from 20 feet to 100 feet. The ground in the existing faces looks good, and there is every reason to believe that the yield for the ensuing year will be equal to that of the past twelve months. The shale walls are of a very soft and treacherous nature, rendering the removal of a large quantity of reef necessary before the yellow ground can be extracted. A certain amount of prospecting work has been done recently on the north-eastern side of the old No. 1 mine, and this work has disclosed a small fissure of promising looking yellow ground. Until more work has been done it will be impossible to make any estimate with regard to the value of this discovery. Exploratory work is being pushed on as rapidly as possible.

UNION MINERAL OUTPUT FOR FEBRUARY.

Gold, Coal, and Base Metals—Total Yield: £3,395,773.

THE monthly returns published by the Mines Department show that the Union mineral output for February (excluding diamonds, whose return is published half-yearly) was of the total value of £3,395,773, as against £3,637,618 in January, a decrease of £241,845. The details for February are as follows: Gold, £3,110,396; silver, £9,820; coal, £161,158; base minerals other than coal, £114,399; total, £3,395,773.

GOLD.

The following table shows the number of mines working in the various districts declaring gold, and the district outputs for February:—

District.	No. of Mines.	Stamps at work.	Tube mills at work.	Output, Fine Gold. Ozs.
Witwatersrand	57	9,370	276	701.994
Heidelberg	3	100	2	6.529
Klerksdorp	3	60	2	2,415
Ottoshoop	1	5	—	20
Pretoria	—	—	—	51
Barberton	12	222	3	6,963
Pilgrims Rest	13	156	6	13.823
Pietersburg	3	30	—	400
Total for Transvaal	92	9.943	289	732,249
Cape	—	—	—	2
Natal	1	5	—	48
Totals for Union	93	9,948	289	732,249

PROGRESSIVE TOTALS.

(Since Commencement of Union).

	Transvaal. £	Cape. £	Natal. £	Union of S.A. £
1910.				
June-Dec.	19,098,807	316	9,786	19,108,909
Year 1911	35,041,485	310	7,246	35,049,041
Year 1912	38,686,250	162	5.276	38,691,688
1912.				
August	3,247,905	8	589	3,248.502
September	3,184,651	12	676	3,185,339
October	3,268,927	15	87	3,269,029
November	3,223,418	19	276	3,223,713
December	3,295,314	8	35	3,295,357
1913.				
January	3.369.193	10	—	3,369,203
February	3,110,18[illegible]	11	205	3,110,396

COAL.

District.	No. of Collieries producing.	Tons mined.	Tons Coal sold.	Value per Ton. Pit's mouth. s. d.
Springs Brakpan	5	56,759	41.519	5 1·99
Middelburg	15	321,819	283,790	4 3·47
Other areas	10	58.785	55,493	3 11·36
Transvaal	30	437,363	380,802	4 4·02
Cape	9	6,629	5,464	10 9·93
Orange Free State	5	50.543	42.509	5 6·48
Natal	22	282,929	212,442	6 0·17
Union of S.A	66	777,464	641.217	—

COPPER AND TIN.

The following statement shows the outpat of copper and tin for February:—

COPPER.

	Output. Tons.	Shipments. £
Transvaal	357	10,307
Cape	2,085	60,877
Totals for Union	2,442	71,184

TIN.

	Output. Tons.	Shipments. £
Transvaal	254	32.817
Cape	—	—
Total for Union	254	32.817

OTHER MINERALS.

Sales and shipments of minerals (other than gold, coal, copper, and tin):—

	Tons.	Value. £
Asbestos	56	866
Graphite	4	154
Lime	5,417	8.758
Flint	106	620
	Ozs.	
Silver in gold bullion	78,973	9,820

East Rand Proprietary Mines.

The operations at the East Rand Proprietary Mines during the quarter ended December 31 resulted in a working profit of £276,915 (12s. 2d. per ton). The working revenue was £718,674 (31s. 9d. per ton), and gold to the value of £15,514 was obtained from accumulated slimes. The working cost was £457,272 (20s. 3d. per ton), and the cost of treating the accumulated slime was £5,067 (3d. per ton). The expenditure on authorised notes was £51,685, and the cash position at December 31 was as follows: Financial position after providing for all liabilities, including the two dividends of 12½ per cent. each, but exclusive of the debenture issue of £1,416,700, £198,410 1s. 4d.; less cash assets (stores and materials, sundry debtors, payments in advance, etc.), £134,092 9s. 2d.; balance, cash position, £64,317 12s. 2d. The development results were as follows:—Number of feet driven, risen and sunk (excluding shafts), 15,236 feet; footage sampled, 11,781 feet; average reef channel width, 24 inches; average assay value over reef channel width, 10.5 dwts.; number of cubic feet excavated (stations, ore bins, etc.), in addition to above footage, 138,496 cubic feet. The actual expenditure on development amounted to £40,665 8s. 8d., as against £67,980 provided in the working costs (at 3s. per ton milled), leaving a balance of £27,314 11s. 4d., which, added to the balance at September 30, 1912, of £100,364 4s. 8d., gives a total of £127,678 16s., standing to the credit of development suspense account at December 31, 1912. This amount has been treated as a liability, and, therefore, is not included in the cash position.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

West Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—With reference to Dr. Mellor's articles and maps published in your valuable paper of the 1st and 22nd inst., I beg to state that I made a report on the formation of the Rand strata, and on the so-called Witpoortje break, on the 29th September, 1910, and then came to the following conclusions:—I did not consider that it was a break in the Rand beds, as it is usually understood to be, for the stratigraphical evidence on Roodepoort and Witpoortje does not show it to be so in any way. The Rand beds on the western side are overlapped by the beds of the eastern side. This overlapping of beds was caused through the older formation of the western strata, and through the fact that the younger strata on the eastern side (Roodepoort) were not pushed far enough towards the granite to come into a line with the western end. The two ends of the Rand strata and banket beds were never one structure, consequently it is incorrect to call such a formation a break or fault. I gave my reasons at the time for my conclusions, and you will notice that they are, so to speak, the same on the Witpoortje break as Dr. Mellor's. I notice that Dr. Mellor shows on his maps the Rietfontein fault, north of Krugersdorp, on to Waterval. Can Dr. Mellor explain why the Government reefs north of said fault have formed into basins as shown on his maps lying unconformable on the lower Rand strata? The Rietfontein fault could certainly not have done this. Further, I shall be very glad to know the reason why, on Waterval, Dr. Mellor has marked a probable line of fault on the dolomite and Black Reef formation, where there are not the slightest indications for such a fault being in existence, and more, why he left unmarked the Carpenter line of reefs, outcropping on the western boundary of Waterval. No doubt, a great many points will yet have to be explained by Dr. Mellor concerning the West Rand formation. Dr. Mellor states that the Government Reef in the middle of Waterval strikes in a south and north direction; I must certainly differ from him here, his own map does not show it to be so. Dr. Mellor contends that the Government Reef and the Penwith series of reefs are identical, and I disagree with him on this point also—the Government and Penwith Reefs are two absolutely distinct series of reefs, which was further proved by a borehole put down between the Penwith shaft and the Randfontein Estate mynpacht. Further, Dr. Mellor contends that on Waterval the evidence of the two broad bands of quartzites—with their accompanying shales—next below the Government Reef, is perfectly clear, however, this contention must fall to the ground, because we have only one shale bed underlying the Penwith series of reefs. I think it most essential that Dr. Mellor should give his reasons why he ignored the Carpenter line of reefs and why he marked a probable line of fault on the dolomite and Black Reef formation on Waterval, as by doing this he has certainly upset the whole West Rand geology. On the other hand, the boreholes of the Western Rand Estates have proved the patch of Elsberg series on Middelvlei to be in its proper position, thus proving Dr. Mellor wrong in his fault theory on Waterval, and proving the Penwith series of reefs the Main Reef series on the West Rand. The boreholes and open workings should always be taken into consideration to prove the West Rand geology. Now, I should like to put forward the following questions concerning our Rand strata, to be answered by Dr. Mellor or any other geologist. These questions have never before been asked or explained. (1) Why are the dolomite and Black Reef series conformable to each other and unconformable to the underlying Rand strata? (2) Why are the dolomite and Black Reef series conformable to the old granite when found in contact with the same? (3) Why has every series of reefs its own separate dykes, faults and breaks, which are in no way connected with the over or underlying series of reefs? (4) By what forces were our different Rand beds pushed with an unconformity towards the granite boss? If these questions were gone into and fully and rightly answered, our present Rand geology would have to be re-written.—Yours, etc.,

E. KUMST.

[Mr. Kunst provides matter for much interesting discussion. Dr. Mellor cannot be expected, through the medium of this journal, to answer the questions which are asked by our correspondent, inasmuch as his paper is open for discussion at meetings of the Geological Society, before whom it was read. The letter has arrived too late for us to attempt to explain Dr. Mellor's map in this issue, in reply to Mr. Kunst's objections, but we shall take an early opportunity of dealing with the matter. With regard to the West Rand fault, however, it may be remarked that it is supposed to exist in the Witwatersrand strata, and not in the dolomite and Black Reef which overlie them. Ed., *S.A.M.J.*]

The Efficiency of the White Worker.

To the Editor, *South African Mining Journal.*

Sir,—Your issue of the 22nd inst. contained a letter by a correspondent signing himself "Underground Worker," in which the writer laboriously endeavours to belittle the ability of Rand miners. If "Underground Worker's" *nom de plume* is truly indicative of his vocation (which his palpable lack of knowledge of mining would lead one to doubt), he should be better informed on the matter. Your correspondent, when writing of mining, is very evidently out of his sphere. Many of his remarks are too obviously absurd to call for refutation, whilst his idiosyncrasies regarding things monetary and economic are the veriest twaddle. He did not state what experience he had had underground, but I am inclined to the belief that a few months' tuition under one of the practical Cornishmen he affects to estimate so cheaply would render him more efficient in his vocation and perhaps cause him to modify his conception of the knowledge and ability required to become a successful miner. He might then learn that mining is an art, and to become thoroughly proficient in all its various and diverse forms entails a lifetime of close application, study, and experience. Just as there are good and bad craftsmen in every craft, and good and bad tradesmen in every trade, so are there miners of different degrees of capability and the difference is by no means fanciful. Mining does not consist of marking the "face" and "going back to sleep on the box." "Underground Worker" seems to have no cognizance of the fact that the correct alignment of a hole to ensure getting out a maximum burden with a minimum charge is just as important as the position of the hole on the "face," and to attain this requires constant supervision, for the average Kafir knows just as much about alignment as he does about a differential calculus. Also, to assert that neither the miner, shift boss, mine captain, nor manager possess any technical knowledge of how or where a vein runs is utterly fallacious, and another proof that your correspondent does not know what he is writing about. "Underground Worker" seems to be obsessed with the idea that £30 to £100 per month is an altogether munificent and adequate remuneration for Rand miners. *En passant*, I beg to remind him that the average is very much nearer £30 than £100. He completely loses sight of the one great determining factor, viz.: the existing conditions under which these wages are earned. After ten years (a generous estimate) of underground work in the Rand mines a man becomes, in the majority of cases, a physical wreck, totally unfitted for manual or almost any other form of labour, and if he has not during that term laid by sufficient of his earnings to keep him for the remainder of his life, he and his dependants become an encumbrance on the community he saddles with his presence. In addition to this, sooner or later his life is forfeit, and, in what should be the pride and bloom of his manhood, he dies by inches after suffering the horrors of a thousand deaths in a long and painful illness. That this is no mere chimera of the imagination is borne out by the fact that over three thousand applications have been received for compensation under the new Act. Having regard to these facts, I contend that the wages paid here are inadequate, are not commensurate with the risk, the danger, and the haunting dread of phthisis daily experienced by the man who toils below. This phthisis scourge as long as it exists will always preclude the general adoption of white labour on the Rand. As conditions are the white man merely supervises, and yet the danger of contracting the disease is only too painfully evident, whilst, were the actual work to be done by white men, the evil would be increased in direct proportion to the amount of effort expended, for exertion implies quicker breathing, necessitating a larger quantity of air, and the more air the more dust. The economic objections to the introduction of white labour present fewer difficulties, but these are distinctly formidable. "Underground Worker" imposes too much on our credulity with his fanciful assertion that two men can run two machines. This may be theoretically possible, but instead of tending to greater efficiency and decreased working costs, the adoption of such a scheme would negative the attainment of both these ends. His information concerning the cost of living on the Rand with his ecstatic picture of the sumptuousness of sixpenny meals and the royal way in which one can live for £2 per week must surely come as a revelation to most young men on the mines, but to commit himself to such puerile statements "Underground Worker's" knowledge of the true conditions must be sadly incomplete and his idea of living frugal in the extreme.—I am, etc.,

M. ROACH.

P.O. Box 149, Randfontein,
25th March, 1913.

New Modderfontein.

The report for the three months ended the 31st of December of the New Modderfontein embraces the financial position of the company as at the 31st of December, as reflected in the interim balance sheet, working expenditure and revenue account for the quarter, and appropriation account (subject to audit), also particulars of the quarter's development, reduction operations, etc. The interim (abridged) balance sheet on the credit side shows: Balance of working capital on hand, £162,262; sundry assets—shares, stores, livestock, furniture, sundry debtors and payments in advance, etc., £79,151, and cash at bankers and value of gold in transit, £489,030. The liabilities are to the Government for annuity account £298,598, sundry creditors on account of dividends, stores, wages, Government tax, etc., £291,270, and the balance brought from appropriation account is £110,229. Working revenue and expenditure account, received from gold realised £277,032, or 39s. per ton milled. Working expenditure absorbed £138,300, or 19s. per ton, which left a working profit of £138,732, or 19s. per ton. There was also a profit of £1,154 from treatment of accumulated slimes and sundry revenue, £2,900, making a total of £142,786. The balance of working expenditure and revenue account from the 30th of June was £77,060, making, together with the balance of working capital and expenditure account for six months, £278,774, a total of £355,834. The charges against this sum are Government tax (estimated) for six months £26,899, expenditure on capital account £8,706, interim dividend declared in December £210,000, and the balance, £110,299, is carried to the balance sheet as stated above. On development work 3,767 feet were driven, sunk, and risen, exclusive of stopes. The reef disclosures were as follows:—Main reef—Distance exposed, 1,843ft.; width, 14in.; assay value, 129s, 4d. Reduction works crushed and treated, 145,900 tons. The value of ore before crushing (as reflected by mill yield and value of pulp) was 39s. The total yield was 65,907 ozs., the total yield per ton being 37s. 11d. From 8,700 tons of accumulated slimes treated there was a yield of 579 ozs. The principal items in capital expenditure for the quarter, which amounted to £20,717, were the sinking and lining of the circular shaft, and the new headgear ore bin at No. 2 shaft, these two items accounting for four-fifths of the expenditure. On the 29th of October the circular shaft intersected the reef at a depth of 2,158 feet. The average of all samples taken on the perimeter of the shaft showed the actual reef width to be 20.9 inches, reef value 30.5 dwts. The width of reef and intruded waste parting is 48.4 inches, value 13.2 dwts. The reef is split on the south side and is slightly faulted. This information was given to shareholders through the medium of the Press. Sinking was then continued a further 100 feet, the shaft being stopped at its final depth of 2,258 feet. The work of bricking the shaft and turning the crosscut arches was then entered on, and good progress was made. 196 feet were bricked and the arches at the bottom of the shaft and for the main onloading station completed. It is intended to push development rapidly in this section of the mine. The erection of the new headgear ore bin and rearrangement of crushers interfered seriously with the sorting arrangements, the average sorting for the quarter amounting to only 4.9 per cent., as against 8.4 per cent. for the previous quarter, but the work is now nearly completed and sorting increased in December to 6.9 per cent. No. 12 incline was sunk 580 feet, and is now 942 feet below the 9th level, or a total depth of 4,025 feet below the collar. The payable tonnage developed during the half-year ended the 31st of December was 332,470 tons at 11.4 dwts. Tonnage milled increased 24,200 tons from the previous quarter to 145,900 tons, owing to the more satisfactory labour position, and it was found possible to decrease the grade of ore mined 3s. 8d. per ton, and to increase the profits by £4,000.

The best "Reef Traveller" is the *South African Mining Journal*.

Kleinfontein Group.

The following are the particulars of the results of operations on the New Kleinfontein Company's property for February: Stamps, 200; days run, 27·372; tube mills, 4; tons milled, 46,900; gold recovered, 15,950·824 fine ounces; net value, £67,050 7s. 1d.; profit, £23,890 17s. 1d.; working costs (excluding development), 17s. 3·111d. per ton; development to working costs, 1s. 1·74d. per ton; total working costs, 18s. 4·859d. per ton; capital expenditure, £2,324 15s. 10d. As more convenient to execute necessary repairs to mill foundations on 20 stamps at one time instead of 10, it was decided to run 200 stamps only until these repairs are completed. Efficiency of tube mills exceeds expectations, therefore it is possible, during repairs, to maintain the crushing capacity at 50,000 tons for an average month.

New Vaal River Diamonds.

The eleventh annual general meeting of the shareholders of the New Vaal River Company took place this week at Sidney on Vaal. Mr. J. van Praagh, who presided, stated that the capital of the company remained unaltered at £168,870. During the first six months of the financial period under review the output amounted to £125,000, and therefore exceeded in value that of any previous twelve months of the company's existence. The revenue from other sources was also satisfactory, and showed a substantial increase, whilst the cash assets had increased from £37,000 in June last to £60,000 to-day. The directors had therefore decided to recommend an interim dividend of 10 per cent., whilst the balance of profits made since June would be kept in reserve towards declaring a further dividend for the remainder of the year. Referring to the alluvial areas, the chairman stated that careful and close examination had revealed sufficient alluvial ground carrying excellent diamondiferous deposits in the areas now being worked to last some considerable time.

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Rhodesian Section.

LATEST MINING NEWS.

Miners' Phthisis in Rhodesia—The Mines Department and Gatooma—Abercorn Activities—Strike at the Wanderer—The Rezende Report.

THE question of miners' phthisis is evidently to receive very full and careful consideration in Rhodesia. At the next session of the Legislative Council an Ordinance is being introduced, the draft of which has now been published, which seeks to prohibit the employment of persons suffering from miners' phthisis, or tuberculosis of the lungs or respiratory organs, on underground work on mines. The Ordinance is a short one. It defines miners' phthisis as "*Silicosis* of the lungs," and in order to prevent a sufferer working underground, it places onus both on the man himself and the employer. The former, it states, shall not engage in such labour knowing himself to be affected with the disease, and no employer shall knowingly employ any such man underground. The measure also empowers the Administrator to authorise a doctor to visit any mining location at a reasonable hour in order medically to examine persons employed underground. Breaches of these provisions are to be met with a fine not exceeding £100, with six months' imprisonment with or without hard labour, in default of payment. The measure is undoubtedly a step in the right direction, and, sympathetically worked, should go far towards a betterment in the general position of the disease.

* * * *

According to the *Rhodesia Mining Review*, for some weeks past the inhabitants of Gatooma have been very much incensed at the action of the Mines Department in throwing open to pegging ground lying within the township area, and the Sanitary Board have strongly protested against this proposed encroachment upon their jurisdiction. The Secretary for Mines, however, ridicules the contention that the township ought not to be open to the prospector's pick and shovel. He sees looming in the near future a considerable revenue from licences, etc., and the temptation to gather in the shekels, notwithstanding the inconvenience to the public that will be caused, is apparently too strong for him. "The controversy, however, is not yet at an end, and before it is concluded, Mr. Montagu may see that it is not always the best policy, even from the point of view of his company's bank balance, to ignore public opinion."

* * * *

In the Abercorn district, where the rainfall this season may be said to have been abnormal, there has lately been a good deal more activity than might be generally supposed. At the Mont d'Or mine, which belongs to Messrs. [illegible] & Russell, a secondary reef has been discovered at the 75ft level, running 30 inches in width, and panning well over 25 dwts. to the ton. Messrs. Gaynor & MacAndrew, having disposed of all their properties in the district on option, are about to resume prospecting operations; and other well-known men have lately returned to the district and are looking for contract work.

* * * *

A most important strike has been made at the Wanderer mine. Cabling to the board of the company in London, on the 24th February, Mr. N. H. Griffin (consulting engineer) stated:—"Wanderer reef, adit level, block No. E.1., No. 3 crosscut west, struck body of ore; present width is 45ft. value 7¼ dwts. not reduced; very encouraging. Further development necessary before a statement as to ultimate value can be made." On the 10th inst. the following further cable was despatched:—"No. 3 crosscut west still in ore; present width is 60ft., value 7 dwts., unreduced assay value; from crosscut south drive extended 25ft., unreduced average assay value 17 dwts. over width of drive." We have since been officially informed that the reef is now 70ft. wide.

* * * *

The report of the Rezende Mines, Limtied, for the quarter ended December 31 shows that for the Rezende section the total estimated working costs were £15,944, equal to 25s. 3·703d. per ton milled, the total estimated profit on the section being £2,993, or 4s. 9·013d. per ton. Tributors' royalty is estimated at £1,561. For the Penhalonga section, the total estimated working costs were £17.104, equal to 21s. 2·178d. per ton milled, the total estimated profit being £334, or 4·970d. per ton milled. The aggregate estimated profit for the quarter was thus £4,888. The tonnage milled was as follows: Rezende section, 12,600 tons; Penhalonga section, 16,150 tons. The footage accomplished totalled 1,660 for the quarter. Several attempts have been made to re-start development work on the 650ft. and 900ft. levels of the central section, but in each case the water met with has been too much for the capacity of the pumping plant. The large pumping unit is expected to arrive shortly from England, and after this has been installed development will be pushed on with all possible speed.

The Stereophagus Pump and Engineering Co., Ltd., have appointed Messrs. Jno. Birth & Co., Ltd., of 2 London Wall Buildings, London, E.C., their export agents for the sale of the Stereophagus pump. Messrs. Jno. Birth & Co., Ltd., have just issued a small pamphlet embodying the remarkable results of two tests recently made on a Stereophagus pump installed at a large sewage works in Yorkshire, and will be pleased to mail a copy to enquirers who may be interested in the subject of sewage disposal, and in the pumping of large quantities of water and other liquids. Other literature will also be available before long."

In view of the important diamond discoveries that have recently been made at Klerksdorp on the farms Eastleigh and Goedgenoeg, and the fact that an agitation is assuming considerable proportions for the Klerksdorp Commonage, the property of the Vaal River Gold Fields, Ltd., to be thrown open to the public, the directors have cabled instructions to at once commence prospecting for diamonds on behalf of the company, and allow a limited number of the public to prospect on satisfactory terms.

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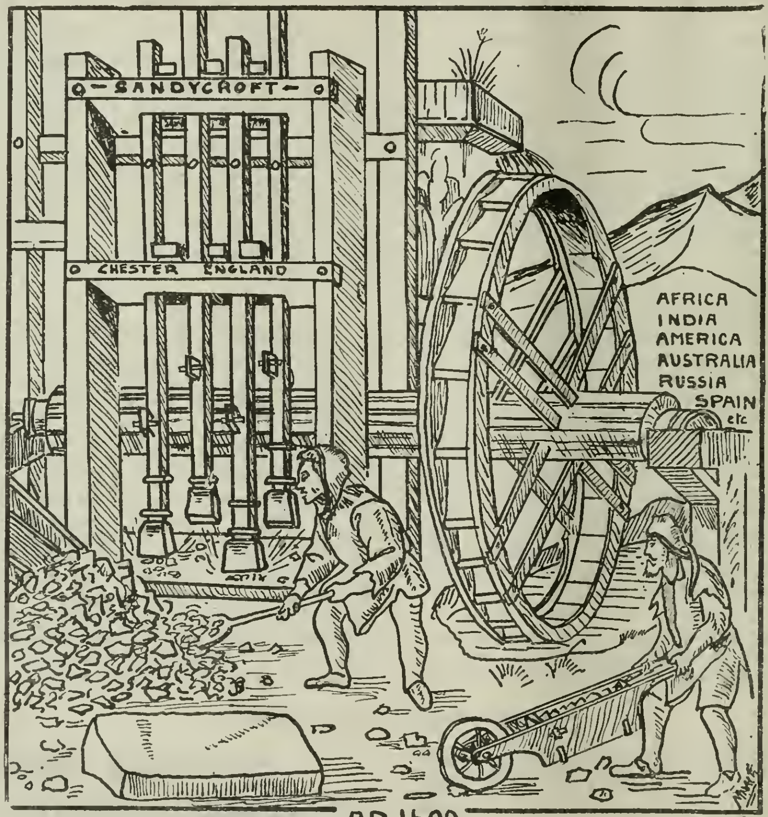

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Engineering Notes and News.

HOMESTAKE v. RAND METALLURGICAL PRACTICE.

Interesting Remarks by Dr. Caldecott and Mr. Brodigan—Consolidated Gold Fields and Brakpan Methods.

THE Bulletin of the Institution of Mining and Metallurgy of February 13th contains some interesting remarks contributed by Dr. W. A. Caldecott to the discussion on the Metallurgy of the Homestake Ore, by Messrs. A. J. Clark and W. J. Sharwood. Dr. W. A. Caldecott remarked: The interest with which the writer has read Messrs. Clark and Sharwood's exhaustive discussion of this subject is enhanced by the recollections of his visit to the Homestake in 1907, and of the courtesy with which the operation of the plant was then explained to him by Mr. J. T. Grier and the authors and by Mr. C. W. Merrill, whose name is so closely associated with the inception and successful development of the cyanide treatment of this ore. In general the impression conveyed by that inspection was that the ore treatment of this world-famous mine had been skilfully adapted in past years so as fully to utilize favourable natural conditions—especially ample water and ample fall—in accordance with the state of knowledge then available, when the main features of the plant and equipment were installed. Past results and the steady dividends paid from low-grade ore for over 30 years are doubtless largely responsible for the continued existence of certain features of practice, which differ from modern practice elsewhere, and to change which would involve capital expenditure. In the following remarks the writer proposes to deal only with some considerations affecting the Homestake crushing and classification practice, as compared with the methods followed on the Rand, with which he is most familiar, and which present a certain analogy as involving the treatment of large tonnages of low-grade ore in which a high percentage of the gold content is readily recoverable by amalgamation, followed by cyanide treatment; concentration and roasting being unnecessary in either case. The main characteristic of the Homestake equipment appears to be the large number of small units involved in handling a large daily tonnage. The thousand 900lb. stamps, and the large number of cone classifiers employed, are striking illustrations of this tendency, which is counter to the policy in vogue elsewhere of utilizing as large units as possible for operations on a large scale. Another feature impressive to a visitor is the enormous area of amalgamated plate, dressed once daily with a stable broom, equivalent to three-tenths of an acre per thousand tons of ore crushed daily at the lead mills. This practice was no doubt evolved in the days when amalgamation constituted the sole source of gold recovery, and has been retained in spite of the present efficient secondary cyanide treatment. From its appearance and slaty composition the Homestake ore appears soft, which renders comparisons of crushing capacity with hard pyritic banket ore difficult, and the grading analyses given are based on screens with apertures different from those in common use on the Rand. The cost of stamp-milling and re-grinding 2,795 tons daily at Lead may be calculated from data in the paper to be 1s. 6·04d. per ton, and the pulp leaving the crushing plant to contain 19·3% + 100 mesh (0·0057in.), and 80·7% − 100 mesh. The cost of crushing 2,542 tons per 24 working hours at the Simmer and Jack Proprietary Mines, Ltd., during October, 1912, using a combination of steam-driven gravity stamps and of tube mills with more costly electric drive, was 1s. 4·453d. per ton, apart from water (0·500d.) and pulp elevation (0·819d.) costs, and the pulp leaving the crushing plant contained 28·8% + 90 mesh (0·006in.) and 71·2% − 90 mesh. The ratio of water to ore in the Homestake battery pulp is stated as 11 to 1, as compared with 4·5 to 1 in the pulp leaving the crushing plant at Simmer & Jack. The high discharge* (10in.) of the Homestake batteries necessitates the use of large volumes of water to wash out the crushed ore, but, even with cheap water and lime, the doubled volume of pulp produced entails a corresponding increase of amalgamated plate area and of classifiers for dealing with the pulp later, and may thus partly account for the hundred-and-one cones employed at the No. 1 plant, as against the fraction of this number which would be needed of larger units with a more concentrated pulp. The stamp duty of 4·2 tons, based on the authors' data, is, of course, due to the use of light stamps and fine battery screen with high discharge. Although tube mills have been employed on a limited scale at the Homestake, the fact that crushing banket ore by their means costs 20% less than by stamps would appear to justify the consideration, even apart from the installation of heavier stamps, of shutting down at least half the thousand stamps, and replacing them by a dozen 5ft.

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* *Trans. Amer. Inst. Min. Eng.*, vol. xxxiv., p. 585.

6in. × 22ft. tube mills, whilst a sufficiently coarse battery screen, with low discharge, might be used to double the duty of the remaining 500 stamps.[†] Very high amalgamation recoveries up to 74%, as at the Princess, are obtained with coarse stamp-milling pyritic banket ore, followed by efficient classification and tube-milling, and, under similar conditions, it is probable that the amalgamation recovery from Homestake ore would rise, owing to the very fine reduction of pyritic particles before overflowing the hydraulic classifiers of the tube mill circuit, and the retention of amalgam in the most efficient trap which the tube mill circuit constitutes. As indicated by the authors, the absence of the tube mill circuit as shown in Fig. 10 has militated against satisfactory work, but with the small feed given—70 tons of sand per 24 hours to a 5ft. × 14ft. tube mill—better results should be obtained by de-watering the pulp inflow feed into the tube mill down to 28% moisture, in place of the 41·2% of moisture actually employed. The mercury consumption of 0·13 ozs. per ton of ore amounts to £130 worth per month, and appears somewhat high as compared with that of 0·035 oz. per ton, which has been attained in modern Rand practice. Beyond the different nature of the Homestake ore, the practice of feeding mercury into the mortar box, and inside amalgamation, and the large plate area exposed to pulp abrasion, no doubt account for the high mercury consumption; but, since all mercury leaving amalgamated plates in tailing pulp contains gold, it is possible that, owing to increased bulk, this gold may be less readily and perfectly dissolved in the cyanide plant than if it had not been previously amalgamated. The authors refer with justifiable satisfaction to the Homestake gold output from 4-dwt. ore during the past 30 years of over £20,000,000, of which £5,400,000 has been distributed as dividends. The average working costs of Rand gold mining companies, largely owing to mining conditions and high cost of supplies, exceed the value of Homestake ore, and no group could show a working profit on 4-dwt. ore with the exception of the Consolidated Gold Fields of S.A., whose working costs for the quarter ended 30th September, 1912, were 14s. 11·859d. per ton, with a percentage recovery equivalent to 15s. 9d. on 4-dwt. ore.[‡]

Mr. Chas. B. Brodigan, formerly manager of the Brakpan Mines, also made some remarks, in which he compared Rand and Homestake practice. He said: The first thing that strikes one is the extraordinary nature of the reduction plant—a mixture of old-time crushing units with very modern slime and precipitation plant. Thus the mill cannot be termed a modern example. The weights are small, the material used for shoes and dies, cam-shaft and stems, is strange to one familiar with Rand practice. It does seem strange to find 86 drops per min. used with a stamp having a maximum weight of 921 lbs. When the screen used is taken into consideration, the duty of 4·2 tons seems good. Again, the question of inside amalgamation troubles one. Why is it used? With the great plate area that is provided, surely the free gold would be caught, and the management would have the additional check of a fairly reliable screen assay on this theoretical extraction.

Concentration.—It is interesting to notice that at previous times attempts have been made to concentrate the Homestake ore, with the result that the concentrate obtained, containing about 50% of iron sulphides, only assayed 7 dwts. of gold per ton. This points to the gold being distributed throughout the ore body in very fine particles. This is quite different from the manner in which it occurs in the Rand banket. The following figures were obtained by

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[†] Compare results at Simmer and Jack East mill, given in the *Transactions* of the Institution of Mining and Metallurgy, vol. xix., 1909-10, pp. 62-3.

[‡] *Cf.* the 1912 annual report of the Consolidated Gold Fields of South Africa, Ltd., p. 15.

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taking a careful sample of sand as it was tipped from a belt into a cyanide treatment tank at Brakpan, South Africa. This sample was carefully panned to separate the pyrites from the clean sand. The residue from the same tank after cyanide treatment was similarly treated, and the respective sections were weighed and assayed with the following results:—

SAND CHARGE No. 160.

	Clean Sand.	Pyritic Portion.
Assay value per ton ...	2·5 dwt.	32·35 dwt.
Per cent. by weight ...	94·6	5·4
Weight of sample	4,365 grm.	249 grm.
Per cent. of total gold ...	57·52	42·48

RESIDUE CORRESPONDING TO ABOVE.

	Clean Sand.	Pyritic Portion.
Assay value per ton ...	0·4 dwt.	1·67 dwt.
Per cent. by weight ...	90·53	9·47
Weight of sample	5,720 grm.	598 grm.
Per cent. of total gold ...	69·59	30·41

These figures would seem to indicate that, as regards Rand ore, the gold is associated closely with the pyrites, and that there is a field for a type of concentration that would pick out the pyritic constituent of the ore and allow that to get thorough treatment, such as fine grinding and special cyaniding. They also show that Rand conditions do not exist at Homestake, and that it is not wise to look upon the practice there from the Rand standpoint alone.

Concentrating Cones.—Here, even when the warning given above is taken into consideration, it seems to the writer that Rand practice is ahead of Homestake. The combination of gravity and concentrating cone shown on p. 25, Fig. 8, seems, when compared with a Caldecott diaphragm cone, or with cones used by Mr. Dowsett at Brakpan, to be a troublesome device. What is to happen when a breakaway occurs? Its effects cannot be observed before the break has assumed large dimensions, and nothing remains for it but to fill the cone up again, and start afresh. Besides, look at the cost of the combination compared with the Rand cone. While on the subject of de-watering cones, it would seem clear that the present system of filling large and expensive cones with sand, of which only a central cylindrical cone takes any part in the concentration, is unwise. The shape should be a combination of cylinders not more than 4ft. in diam., with a conical termination. By using this type, space and expense would be saved.

Re-grinding.—Here criticism is disarmed by the simple admission that they find the Wheeler pans not so well suited to the work as the small tube mill with which they are experimenting. With regard to the tube mill, it is impossible to state positively that it should work with ore, but, before resorting to the expensive flint pebbles, some other form of liner besides silex blocks should be tried. A drier feed and a larger load might also help matters along.

Precipitation of Gold by Zinc Dust.—It will, I think, be interesting to supplement the authors' description of this method by relating some of the experiences gained in starting up the Merrill presses which formed the precipitation element in the Brakpan Mines plant. The installation consisted of three Merrill presses with belt feeders. These belt feeders caused the first trouble, as they were equipped with a very ingenious but very badly constructed feeding mechanism that was, to say the least, irregular in action. When the trouble was eventually overcome, the belt system really formed a satisfactory feeder, in fact, preferable to the later type sent out. It was also found that the presses required to be supplied with very clear solution. Slightly turbid solutions, that would not have any effect on the precipitation in zinc boxes, have caused the cloths to choke, and caused a rapid rise in pressure in the press, necessitating by-passing and resting of the press. Then it was found advantageous to keep the cyanide strength higher than would be the case with zinc boxes. The great trouble with the presses, which existed up to the time the writer left Brakpan, was that the precipitation seemed less reliable than with zinc shavings. There was a constant anxiety that something was not right, and, were it not for the gold test devised and used by Mr. Dowsett, the reduction officer, the anxiety for all concerned would have been much greater. This test is made as follows:—1000 cc. of cyanide solution are poured into a wide-necked bottle; to this is added three drops of saturated solution of lead acetate; the mixture is then shaken. Add 0·75 grm. zinc dust. Shake again. Add 20 cc. of saturated cyanide solution and shake for 30 sec. Pour into an evaporating dish and allow dust to settle. Pour off solution, put dish on a spirit lamp, and dissolve zinc dust with about 10 cc. of aqua regia; boil this until the bulk is reduced to a volume of about 4 cc. Allow the chloride of lead to settle, and then pour the solution into a test tube. Cool the solution in the tube, and add two drops of a solution of tin chloride. If gold is present to the extent of 0·02 dwt. per ton of the original cyanide solution, a very slight colouration will be perceived in the liquid; 0·03 shows a slight yellow; 0·04 slight pinkish-yellow; 0·06 strong pink; 0·08 the purple of Cassius. The great advantage of a test of this nature lies in the fact that the shiftsman can make it in a few minutes, and he can be certain that precipitation is going on satisfactorily. There is no need to wait for assays to be made. In spite of the troubles that were experienced, which are, after all, incidental to the starting up of a new method, it came to be admitted that the presses possessed several advantages when compared with the zinc shaving system. Thus less time and labour were spent on the clean-up. There was no gold left in the plant after the clean-up. The space occupied by the plant is smaller than that occupied by zinc boxes. The richer gold slime left after acid treatment and calcining resulted in decreased time and expense in smelting. There were fewer samples to be assayed, and, finally, the gold in the press was safe from theft. There still exists the variability in the nature of the zinc dust supplied; some consignments being much more efficient than

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others. It is certainly a drastic step to destroy a complete set of outer cloths every month. It has not so far been found necessary to do this on the Rand. The thanks of everyone interested in the metallurgy of gold is due to the authors for their notable contributions to the subject. It can be said truly, "they build on sand," of anyone who attempts to describe current practice in gold metallurgy, but at least the authors have by their ability and thoroughness given food for thought to the many interested in their work.

Compressed Air at Panama.

One of the largest air-compressor plants in the world is that which supplies compressed air for the work on the Panama canal. Of the four separate stations, the one at Empire is the largest and the one at Balboa the smallest. The other two are at Las Cascades and Rio Grande. The air compressors at Las Cascades, Empire and Rio Grande deliver their entire output into a 10-inch main, 11 miles long, from which it is drawn off by smaller subsidiary mains to the air drills and other machinery at various points along the canal. The greater part of the air is used in and around Culebra Cut. The plant at Balboa comprises two compressors, each capable of delivering 2,200 cubic feet of air into a main four miles long. The two plants thus have 18 miles of air-compressor mains.

Mr. de Ferranti, who is a well-known electrical authority, has effected important improvements in the construction of the steam turbine in the direction of working it at a much higher temperature than is possible now. This means that the commercial efficiency of the turbine will be greatly increased. The turbine using high temperature steam gas will successfully compete with the oil internal combustion engine in the production of power. This will naturally create a greater demand for coal, and the field for benzol production on a large scale will in this way, too, be greatly extended. The improvements mentioned above relate to the treatment of the turbine blades, to the surfaces of which Mr. de Ferranti electrically welds sheets of pure nickel, thus enabling them to withstand the higher working temperatures of the gasified steam—a step forward in the development of the internal combustion turbine, the chief problem of which is to make the blades heat-resisting.

Finance, Commerce, and Industries.

Delagoa Bay Coaling Installation. The amended tenders for the supply and erection of a coaling installation for this Port were opened this week at the Public Works offices. It will probably be a week or two before the decision is made, as the whole of the tenders have to be carefully considered and then submitted to the S.A.R. authorities in Johannesburg before the final selection is arrived at. The following were the tenders put in:—Maschinen, Augsburg-Nurnberg A. G. (represented by Orenstein-Arthur Koppel, Ltd.), one tender, £26,985. McMyler Interstate Co., of Cleveland, Ohio (represented by the Lourenco Marques Forwarding Co.), six tenders: First, £30,000; second, £39,435; third, £42,770; fourth, £28,985; fifth, £30,425; sixth, £23,250. Reunert and Lenz, Johannesburg (representative, L. Zagury)—without foundations, £24,768; with foundations, £33,268. Bellamy and Lambie, Johannesburg (represented by the Delagoa Bay Agency), one proposal, £43,188; if with 64 boxes and 10 trucks, plus £10,475; and if a period of twelve months is allowed for above tender the amount will be reduced to £40,789. Jeffrey Manufacturing Co. (per J. and R. Niven, Johannesburg, represented by the Lourenco Marques Forwarding Co.), two tenders—without foundations, £34,475; with foundations, and eight months to build, £36,133.

* * * *

British Trade with South Africa. The following statement is supplied by the British Trade Commissioner's Office, Capetown, covering the external trade of the United Kingdom for the year 1912, with special reference to British South Africa. The accounts relating to the trade and navigation of the United Kingdom for December, 1912, show that the total values of merchandise imported into and exported from the United Kingdom in 1912 were considerably greater than in any previous year. The figures were:—Imports, £745,000,000; exports (United Kingdom produce and manufactures), £487,000,000; re-exports (of foreign and Colonial merchandise), £112,000,000. These totals show, on comparison with the totals for 1911, the following increases:—Imports, £64,500,000, or 9·5 per cent.; exports, £33,250,000, or 7·3 per cent.; re-exports, £9,000,000, or 8·8 per cent. The increase of 64½ millions in the value of imports includes the following increases:—Food, drink, and tobacco, about £17,000,000; raw materials and articles mainly unmanufactured, £27,500,000; articles wholly or mainly manufactured, £20,000,000. About two-thirds of the increase of 33¼ millions in the value of the exports of the produce and manufactures of the United Kingdom is accounted for by articles wholly or mainly manufactured. During the last decade, imports have increased in value by 41 per cent, experts of United Kingdom produce and manufactures by 72 per cent., and re-exports of foreign and Colonial merchandise by 70 per cent. The foregoing statement relates to merchandise only. The total values of gold and silver bullion and specie handled during the year 1912 were: Imports, £69,500,000; exports, £65,000,000. The values of the imports from, and of the exports and re-exports to British South Africa were (merchandise only, exclusive of gold and diamonds):—Imports (1911) £10,012,000, (1912) £11,410,000; exports (1911) £21,263,000, (1912) £22,270,000; re-exports (1911) £1,828,000, (1912) £1,926,000. There was thus an increase, in 1912, under each of the three heads. Among the principal articles were the following:—Imports from British South Africa in 1912: Wool (sheep's or lambs'), £4,545,000; mohair (Angora goats' hair), £1,030,000; skins (goats' or sheep's), £1,107,000; feathers and down (ornamental), £2,171,000. Exports of United Kingdom produce and manufactures to British South Africa in 1912: Iron and steel and manufactures thereof (so far as distinguished in the monthly accounts), £2,547,000; machinery (so far as thus distinguished), £1,281,000; cotton piece-goods, £1,260,000; apparel, £3,276,000; boots and shoes (of leather), £1,177,000. The value of the gold bullion imported in 1912 from British South Africa was over £41,000,000, as against about £37,000,000 in 1911.

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WHAT THE UNION MINES BUY.

A Grand Total of £12,660,047 Expended in 1912—The Share of Each Province.

The following list, prepared by the Mines Department, shows the value of stores and machinery consumed by the mines of the Transvaal in 1912:—

Classification.	Totala for the Transvaal.	
	Weight or Quantity.	Value. £
Bags (value)	—	17,924
Belting (value)	—	125,818
Bolts, nuts, washers and rivets (lbs.)	3,777,708	45,646
Brattice cloth (value)	—	1,002
Bricks (value)	—	26,768
Candles (lbs.)	12,651,476	220,567
Carbide (lbs.)	4,609,769	51,200
Castings—		
(a) Brass (lbs.)	492,452	28,641
(b) Iron (lbs.)	6,444,750	90,897
Cement—		
(a) Casks (number)	10,146	14,962
(b) Bags (number)	99,786	42,329
Chemicals and assay requisites (value)	—	190,686
Coal-cutting machines (number)	42	2,467
Coal-cutting machine spares (value)	—	4,073
Coal—		
(a) Smithy (tons)	29,181	38,333
(b) Steam (tons)	2,238,655	1,254,264
Coke—		
(a) Imported (tons)	1,473	9,853
(b) Local (tons)	1,809	5,725
Cyanide (lbs.)	11,677,925	486,085
Disinfectants (value)	—	17,868
Electrical machinery (value)	—	398,181
Explosives—		
(a) Blasting gelatine (cases)	498,122	1,135,232
(b) Gelignite and gelatine dynamite (cases)	206,662	370,718
(c) Dynamite No. 1 (cases)	4,575	5,950
(d) Dynamite No. 2 and ligdyn (cases)	62,821	79,676
(e) Other explosives (cases)	—	3,600
(f) Detonators (boxes)	319,312	37,214
(g) Electric detonators (or electric fuses) (No.)	382,900	2,153
(h) Safety fuse (coils)	8,598,930	155,170
Fencing and wire netting (value)	—	3,874
Fodder for stables—		
Bran, chaff, mealies, forage, etc. (value)	—	36,684
Hosing (steam, suction and rock-drill) (value)	—	67,247
Hand tools (picks, shovels, hammers, etc. (value)	—	81,858
Iron—		
(a) Bar and angle (lbs.)	9,416,933	75,297
(b) Galvanised (feet)	993,010	23,075
(c) Sheet (lbs.)	249,855	2,603
Lamps and spares (value)	—	17,792
Lead—		
(a) Pig (lbs.)	194,897	2,145
(b) Sheet (lbs.)	47,835	694
Lime—		
(a) White (bags)	491,472	121,036
(b) Blue (bags)	29,980	5,234
Lubricants—		
(a) Oils (gallons)	1,047,860	118,242
(b) Grease and tallows (lbs.)	4,659,410	76 576
Machinery and machine tools (value)	—	634,512
Mercury (bottles)	3,291	30,466
Metals (anti friction) (lbs.)	268,477	23,360
Mill screenings (value)	—	27,582
Mill spares (value)	—	125,666
Foods, etc. (for coloured labourers)—		
(a) Beans and rice (lbs.)	11,612,955	98,574
(b) Meal (mealie, Kaffir corn, etc.) bags)	618,138	356,342
(c) Malt and cereals for beer (value)	—	23,002
(d) Meat (lbs.)	33,042,904	508,762
(e) Salt (lbs.)	1 251,897	2,399
(f) Groceries, coffee, sugar, molasses (value)	—	45,620
(g) Sundry food, including bread (value)	—	178,023
(h) Vegetables (value)	—	51,371
(i) Medicines, etc. (value)	—	37,777
(j) Clothing (value)	—	27,906
Packing (lbs.)	435,457	43,331
Paint, tar, drying oils, etc. (value)	—	23,477
Paraffin (cases)	42,903	21,942
Pipes and pipe fittings (value)	—	350,015
Rails, crossings, sleepers, etc. (value)	—	208,455
Rock-drills (number)	3,128	67,408
Rock-drill spares (value)	—	182,598
Ropes—		
(a) Wire (value)	—	123,862
(b) Cotton and manilla (lbs.)	342,259	11,965
Screws, nails, etc. (value)	—	18,805
Shoes and dies (lbs.)	15,667,191	142,411
Skips and spares (value)	—	15,336
Stationery (value)	—	65,477
Steel—		
(a) Bar, tool, cast, etc. (lbs.)	2,245,601	28,081
(b) Sheet (lbs.)	12,396,779	91,200
(c) Hand-drill (lbs.)	5,181,358	72,933
(d) Rock-drill (lbs.)	7,072,152	105,360
Timber—		
(a) Building material (ceilings, floorings, doors, etc.) (value)	—	34,715
(b) Oregon, pitch pine, etc. (cub. ft.)	1,533,072	295,341
(c) Mining poles and round lagging (value)	—	316,449
(d) Deals (feet)	4,755,247	143,761
(e) Fuel (value)	—	24,104
Tube mill requisites—		
(a) Pebbles and flints (value)	—	6,133
(b) Liners (sets)	475	53,651
(c) Other requisites (value)	—	18,333
Trucks and spares (value)	—	87,968
Washing plant spares (value)	—	25,983
Waste (lbs.)	853,331	17,573
Water purchased (value)	—	128,741
Zinc and zinc discs (lbs.)	9,521,747	166,427
Sundry articles not specified above (value)	—	376,939
Total value	—	10,965,500

The following table gives the total expenditure on mine stores in the Union for the year:

		Gold Mining Industry.	Diamond Mines.	Coal Mines.	Base Mineral Mines.	Lime and Flint Works.	Total.
		Value. £	Value. £	Value. £	Value. £	Value. £	Value. £
Witwatersrand	£9,753,751						
Outside Witwatersrand	454,253						
Total Gold Mines	£10,208,004						
Reef Diggers	65,975						
Metallurgical and Tailings Works	34,949						
Transvaal		10,308,928	340,903	266,557	170,036	47,467	11,133,891
Cape Colony		285	671,898	7,481	135,866	1,415	816,945
Orange Free State		299	453,350	44,298	—	1,642	499,589
Natal Gold Mines	£1,237						
,, Reef Diggers	1,191						
Natal		2,428	—	204,689	1,233	1,272	209,622
Union of South Africa	£	10,311,940	1,466,151	523,025	307,135	51,796	12,660,047
Year 1911	£	11,714,755	1,450,127	554,782	305,830	55,614	14,071,108

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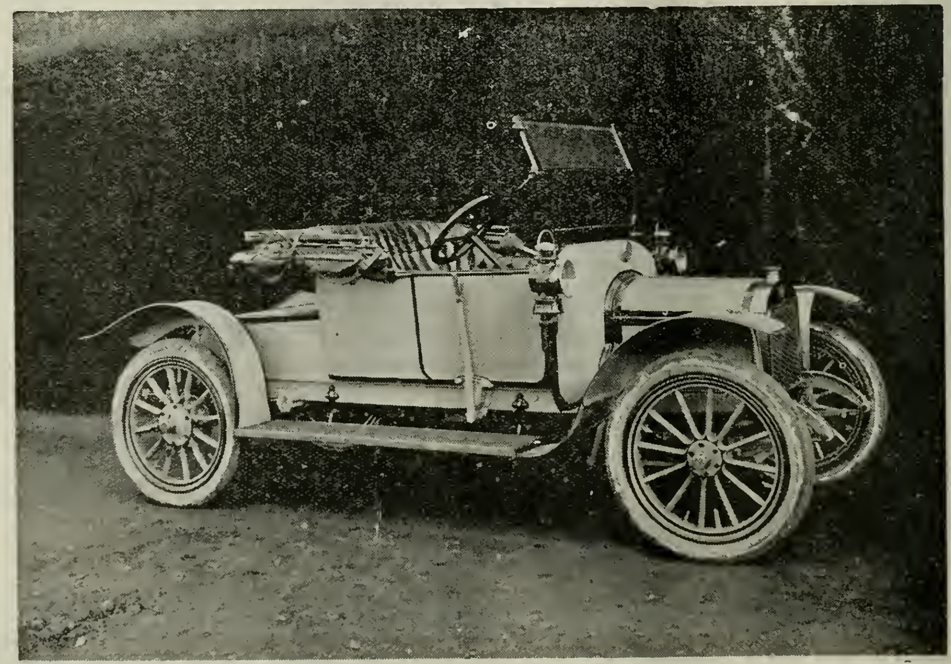

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Automobile Notes.

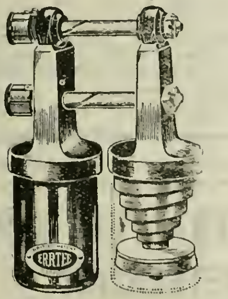
The question which is now puzzling travellers and pleasure-seekers alike is (says the *Motor Cycle*) which vehicle will give best value for money, the sidecar or the cyclecar? Those possessing reliable motor bicycles with a comfortable sidecar attached are quite satisfied with their mounts, and are loth to embark on what, to them, is the new motoring, for they doubt if they could get better value for their money than they do at present. On the other hand, there are many who are new to motoring altogether, and it is these who are undecided as to which class of vehicle will best suit their requirements. The question can best be decided by each individual weighing for himself the pros and cons of the two types of machines, for on each point of comparison there exists a difference of opinion. For instance, some claim the superior comfort of the cyclecar, and while it is generally admitted that the driver of a cyclecar is more comfortable than he would be on a motor bicycle, it is doubtful if the passenger could find a more comfortable and protected seat than the average well-sprung sidecar, with its hood and screen, provides. There are many other points of comparison on which the prospective purchaser must decide for himself, such as price, convenience of storage, handlebar or wheel steering, stability, running costs, accessibility, sociability, and luggage-carrying capacity. On some of these items the sidecar scores, while on others the cyclecar obviously has the advantage; consequently it rests with the purchaser to decide for himself which vehicle will be more likely to give him a good return for his money.

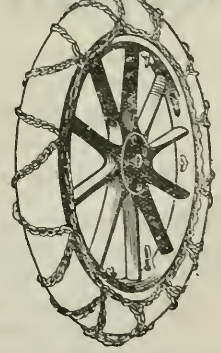
* * * *

Further interesting evidence before the Motor Traffic Committee of the House of Commons by the police authorities shows that every care is taken to see that public service vehicles are in an efficient condition. Last year no fewer than 31,563 vehicles were ordered off the streets temporarily for defects in regard to brakes and steering gear. Representations of the Public Carriage Department of Scotland Yard make frequent visits to garages for the purpose of carrying out brake tests, etc., as many as 500 such tests being made in a week. Increases in the number of street refuges and subways are strongly urged as means of reducing the numbers of accidents. It is strongly held by the Metropolitan Police that tramcars, owing to the large area they obscure, form one of the chief causes of accidents, and in this connection Sir Edward Henry, the Chief Commissioner, expressed himself most emphatically against the use of trailer cars. It was pointed out to the Committee that, taking the figures from the official returns at they stand, during the period of two and three-quarter years ending 30th September, 1912, there were 292 fatal accidents due to motor traction on the 149 miles of streets in the County of London containing tramways, whereas on 215 miles of equally important streets not containing tramways there were only 199 fatal accidents. Clearly the inference to be drawn is that the presence of tramways on a street increases the danger. In fact, Scotland Yard appears to consider that the proportion of fatalities on a tramway street is twice that on a non-tramway street.

* * * *

Most owner-drivers will learn with surprise that they owe a legal liability to the passengers they carry in their cars. A case was recently heard in the Bombay High Court, in which a native owner-driver was sued for damages by a passenger who had, in an accident which occurred during a drive to which he with some other friends had been





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invited, sustained serious injuries. The Judge held that the accident arose through the gross negligence of the owner, who drove the car himself, and that the fact that the plaintiff was a guest at the time made no difference to the host's legal liability. He awarded damages to the extent of 38,000 rupees. At first view, this aspect of the law may seem startling to many to whom one of the pleasures of motoring is to take their friends out for drives with them, but of its correctness and justice there can be no doubt. If a man chooses to risk his own life by reckless driving, let him do so when he is alone in the car. He has no right to risk his friend's, for it must be remembered that the liability is only incurred when gross negligence has been shown. The justice of this state of the law is readily realised when the duty of one user of the road towards another is considered. Each user must take reasonable care to so regulate his speed as not to endanger another. If the passenger had been a pedestrian there would be no question as to the motorists liability in regard to him. Why should he, then, be deprived of the law's protection because he is seated in the motorist's car?

* * * *

The cycling organisations of Great Britain recently called together a conference of road users for the purpose of discussing questions connected with the safety of the roads. The first meeting was attended by representatives of practically all organisations of road users, including the R.A.C., A.C.U., A.A. and M.U., Roads Improvement Association, C.M.U.A., etc. It was unanimously decided that a committee of twelve members of the conference be appointed to consider and report at a further meeting of the conference on the following: (a) Whether any alterations in the existing rules of the road are desirable, and the best method of enforcing a rigid adherence of them by all vehicles in both town and country; (b) the penalties for non-observance of the rule of the road or for driving to the common danger; (c) the advisability of increasing the minimum age of motor

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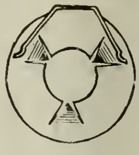
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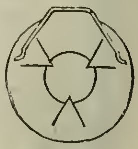
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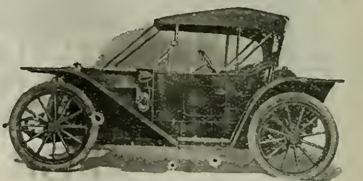

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cycle licences from fourteen to eighteen years; (d) the necessity for uniformity in warning signs; (e) the steps to be taken to secure an alteration in the law in order that all the regulations agreed to as necessary to secure safety on the roads may be enforced; (f) the establishment of a permanent central board of control; (g) the bringing of pressure on street authorities to induce them to diminish the camber in every case where streets are being re-laid; and (h) the amendment of the Lights on Vehicles Act, 1907, so as to make it applicable for general use throughout the British Isles, and that such amended Act should be sufficiently comprehensive in character for all modern traffic and repeal existing Acts and by-laws appertaining thereto. Also that county and municipal authorities should be disempowered from making by-laws regarding the lighting of vehicles except for exemption purposes. It is to be hoped that the conference will be in a position to present its findings to the authorities concerned at the same time as the Report of the Select Committee on Motor Traffic is submitted to Parliament, as the unanimous recommendations of so influential a body, composed, as it is, of representatives of all classes of road users, are bound to carry weight in the proper quarters.

Where South Africa Fails.

The value of articles imported into the Union during January which were capable of being produced in the Union of South Africa was as follows:—

Chicory	£2,086
Corn, Grain and Meal—	
Barley	78
Beans and peas	6,579
Malt	10,836
Wheat	97,867
Fruit—	
Dried	1,709
Bottled, tinned, etc.	1,273
Sugar and sugar products	70,765
Tea	24,064
Vegetables—	
Potatoes	9,744
Dairy products—	
Butter	23,900
Butter substitutes	4,496
Cheese	13,891
Milk	33,392
General farm produce—	
Eggs, fresh	76
Ham and bacon	14,119
Lard	4,177
Meats, frozen—	
Beef	18,748
Mutton	5,609
Meats, salted or cured	98
Meats, preserved	8,492
Miscellaneous articles of food and drink—	
Aerated waters	2,196
Biscuits	4,057
Cakes	636
Confectionery	16,835
Jams and jellies	3,177
Pickles and sauces	4,735
Salt, common and table	1,059
Vinegar	856
Miscellaneous articles, not food and drink—	
Acetic Acid	10
Candles	814
Cement	13,534
Coke and patent fuel (tons)	4,003
Earthenware, including bricks	16,495
Furniture	65,878
Leather—	
Saddlery and harness	7,174
Manufactured, n.o.d.	10,031
Unmanufactured	20,309
Oils—	
Castor	1,758
Linseed	4,694
Rope and Cordage	3,480
Soap, Common	5,514
Stone, marble and slate for building	3,488
Tobacco—	
Unmanufactured	2,431
Cigars	2,431
Cigarettes	9,954
Manufactured	425
Vehicles—	
Carts, carriages, wagons and parts not motor	3,669
	£611,323

Glencoe (Natal) Collieries.

The eleventh annual general meeting of shareholders will be held in the Board Room, 148a, Stock Exchange Buildings, Johannesburg, on Friday, the 28th day of March, 1913, at 12 noon, for the usual business and purposes.

Ferreira Deep.

The directors of the Ferreira Deep, Ltd., notify the declaration of a dividend (No. 20) of 25 per cent. (5s. per share) for the half-year ending 31st March, payable to shareholders registered at that date. The dividend will be paid on or about the 5th May, both at the head office, Johannesburg, and in London and Paris. The amount to be distributed is £245,000.

"The Jumpers" G.M. Co.

The directors of the Jumpers G.M. Co. notify the declaration of a dividend (No. 28) of 5 per cent. 1s. per share), payable to shareholders registered at the 31st March. The dividend will be paid to registered shareholders in Johannesburg and London on or about the 5th May. The amount to be distributed is £5,000.

Bellevue Tins.

The secretary of the Bellevue Tins, Ltd., writes regarding the letter that recently appeared, signed "Shareholder" (?) referring to the statement reported to have been made by the Minister of Mines regarding the property of the Bellevue Tins, Ltd.:—"In reply, I would point out that if he is really a registered shareholder, then why in the first place did he not apply (as other shareholders have) to the secretary, Transvaal Bank Buildings, where full particulars as to the development work done, etc., etc., could be obtained. Further, I may mention that inspection of the workings is open to any interested party. Regarding the misleading statement spoken of, this matter has been taken up with the Chief Government Engineer, with a view to an enquiry, and a full report of the enquiry, it is to be hoped, will be shortly available."

INVESTORS' DIARY.

The following company meetings have been announced:—

April 25.—Worcester Exploration Co., at Worcester, C.P.
May 10.—Roberts Victor.
May 21.—Apex Mines; New Kleinfontein.
May 27.—Transvaal Coal Trust; Brakpan Mines; Springs Mines; New Era Consolidated.
May 29.—Roodepoort United; West Rand Consolidated; Meyer and Charlton; New Goch.
May 30.—Sacke Estates; Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries.
June 3.—Modderfontein B.; Robinson.
June 4.—Rose Deep; Village Deep.
June 5.—Durban Roodepoort Deep; City Deep.
June 6.—Bantjes Consolidated; Geldenhuis Deep; Crown Mines.
June 18.—Rand Mines.
July 15.—Transvaal Consolidated Lands.

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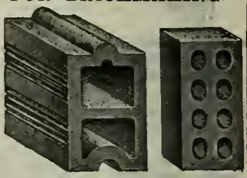

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DECLARATION OF DIVIDEND No. 20.

NOTICE IS HEREBY GIVEN that an Interim Dividend of Twenty-five per cent. (Five Shillings per share) has been declared by the Board for the half-year ending 31st March, 1913.

This Dividend will be payable to all Shareholders registered in the Books of the Company at the close of business on 31st March, 1913, and to holders of Coupon No. 20, attached to Share Warrants to Bearer.

The Transfer Books of the Company will be closed from the 1st to the 7th April, 1913, both days inclusive.

The Dividend will be payable to South African Registered Shareholders from the Head Office, Johannesburg, and to European Shareholders from the London Office, 1, London Wall Buildings, London Wall, E.C., on or about the 5th May, 1913.

Holders of Share Warrants to Bearer are informed that they will receive payment of the Dividend on presentation of Coupon No. 20, at the London Office of the Company, or at the Compagnie Francaise de Banque et de Mines, 20, Rue Taitbout, Paris.

Coupons must be left four clear days for examination, and will be payable at any time on or after the 5th May, 1913.

By Order of the Board,

RAND MINES, LTD., (Secretaries).
S. C. STEIL, Joint Secretary.

Head Office, The Corner House,
Johannesburg, 18th March, 1913.

59371

THE SOUTH AFRICAN
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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

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Notes and News.

New Mills on the Witwatersrand. We understand from reliable sources that in addition to the augmentation of stamping capacity at the Simmer Deep and Jupiter mines referred to by Mr. Christopherson the other day, the question of increasing the plant at two other important Rand mines is now receiving consideration. Furthermore, it is probable that construction of an entirely new plant of medium capacity will be commenced at an early date. No doubt these decisions are largely the result of the better complexion of affairs in connection with native labour on the Witwatersrand. We are not at the moment of writing at liberty to name the mines referred to in the foregoing, but no doubt definite and official pronouncements will be forthcoming at an early date.

* * * *

The Barnato Mines. The annual reports and accounts of the Barnato group of mines for the year 1912 have been issued and we propose to deal with them in our next number. At the Consolidated Langlaagte it is to be remarked that the mine has now an efficient surface plant, and the ore reserves stand at such a satisfactory figure that there is every reason to look forward to a prosperous future. The New Unified report states that the future policy of the company will tend to a slight lowering of the grade, but that by increasing the tonnage milled and decreasing the development expenditure, it is expected that the profits will not be greatly affected. Further quantities of ore having been found in the old workings, also, will help to increase the life of the mine. The Glencairn has 205,418 milling tons in reserve, and 1,111,164 tons of doubtful value of which, possibly, 50 per cent. may be looked upon as milling ore. The Witwatersrand Deep shows satisfactory development results and with a better labour supply improvements are expected in the returns within the next few months. At New Rietfontein some 135,887 milling tons are in reserve, with a possible addition of perhaps 50 per cent. of 260,214 tons of uncertain value. Ginsberg is to instal a small slime plant to treat the 60,000 tons in the old Balmoral dam.

* * * *

Glencoe Collieries. Shortage of trucks and of labour were the keynotes of Mr. A. Mackie Niven's address at the eleventh annual meeting of the Glencoe Collieries a few days ago. The output, but for these adverse factors, would have been substantially greater. As it was a profit of £11,749 was earned and a dividend of 9d. per share was distributed. The output of the company is now at the rate of over 20,000 tons per month, and it is gratifying to learn that the profit earned in January was £1,801. The company has an interest in the East Rand Proprietary Mines, which has yielded 5 per cent. on the capital invested. Mr. Niven anticipated an increased dividend from this source in the near future.

* * * *

The Second Mining Exhibition. Attention is again drawn to the opening of the second mining exhibition on the 16th inst. It will be remembered that the first mining exhibition organised by the Chemical, Metallurgical and Mining Society, held at the School of Mines in February, 1912, was so successful that the Council of the Society decided to hold a second exhibition of a similar nature. The first exhibition, although somewhat hampered by lack of space was visited by some 15,000 to 17,000 persons. A number of intending exhibitors were crowded out, but since double the amount of space will be available this year, through the kindness of the Volunteer authorities, it is hoped that all the exhibits forthcoming will be accommodated. The scope of the exhibition is thus set out in the first circular issued early in December last, and may be outlined generally as follows:—Safety and rescue apparatus (such as helmets, stretchers, and other ambulance appliances, etc.). Chemical, metallurgical and mining apparatus, including models of every description. Specimens of crude and manufactured natural products of the country, as for instance:—Asbestos, graphite, mica, salt, fireclay, limestone and shales for the manufacture of cement, magnesite, oilshales, copper, iron and other ores, and so on. Plans, diagrams and photographs of mines, works and plants, machinery and apparatus. To a certain extent the size of the exhibits must be limited, both by exigencies of space and by the size of the doors of the building, viz., 4 ft. wide. Exhibits may be divided into two sections:—(a) Those exhibited by inventors or by members of the Society, comprising devices or apparatus used in any manner on the mines, or diagrams and plans of same. (b) Exhibits of local commercial firms or representatives of oversea mining or engineering firms or companies. Members of the Society and others who are desirous of exhibiting apparatus or models of any description are requested to advise the secretary as soon as possible. It is hoped that mining and metallurgical men who may have models of any device or apparatus connected with their work will take this opportunity to bring them to the notice of the public. The exhibition is primarily for the information and benefit of those engaged in or interested in mining work, and to give those in search of mineral products an opportunity of ascertaining where these products may be found or obtained or *vice versa*. It is not in any way looked upon as a source of financial gain to the Society.

* * * *

Natural Mineral Products. With a view to assisting the farmer and prospector to come into contact with manufacturers and others desirous of utilising the natural mineral products of the country, such as limestone, fireclay, asbestos, sulphur, graphite, mica, salt, etc., etc., the Committee of the Mining Exhibition (to be held in Johannesburg during the last fortnight in April) will be pleased to exhibit any samples of such products free of charge. Samples (which will not be returned but will be handed to the local Museum) must not be less than two pounds in weight, be clearly labelled with the name and address of the sender, and be accompanied with any further details possible regarding the nature and size of the deposits. The samples, which can be sent by Agricultural Parcel Post (not more than 3 lbs. for 6d.) should be sent to the Secretary, to reach him not later than the 10th April.

* * * *

Gold Mining in Australasia. Gold mining in Australasia has steadily declined since the year 1900 or thereabouts; it has assumed the character of a mining disease (says a Sydney paper), and in the Northern State it is developing into galloping consumption. With commendable forethought the Press calls on the State Government to assist the industry and save it from extinction, and the State Government replies that it is willing to spend some revenue in assistance if the Press will point out a safe method of expenditure. So far the safe method is not apparent, and the industry is hopelessly preparing for its funeral ceremonies. West Australian mines were 12 years ago yielding their best; the return from those rich fields was large, and the somewhat sudden increase, added to the gold production of other States, brought the total up to some 16 millions of money. Shortly afterwards decay set in and year after year the falling off has occurred with painful regularity, and this year eight millions will, roughly speaking, represent the total yield. As there are no indications of a rapid revival, the outlook, from every point of view, is decidedly unpromising, and for the Northern State distinctly depressing." It must not, however, be forgotten that the decline in gold production is largely compensated by the increased output of other metals.

* * * *

A Coming Congress. It is proposed to hold in London, in the early part of June, 1915, the Sixth International Congress of Mining, Metallurgy, Applied Mechanics and Practical Geology. These congresses take place at intervals of five years, and the last, which was brilliantly successful, was held in Paris and Lieye. The attendance at the Düsseldorf Congress was over 2,000, and it is anticipated that the attendance in London in 1915 will be equally large. An influential committee has been formed to make the necessary arrangements, and the movement is being actively supported by the University of London, Imperial College of Science and Technology, Geological Society of London, Institution of Mechanical Engineers, Iron and Steel Institute, Society of Cheminal Industry, Institution of Mining Engineers, Institution of Mining and Metallurgy, Institute of Metals, South Wales Institute of Engineers, Cleveland Institution of Mining Engineers, West of Scotland Iron and Steel Institute, Staffordshire Iron and Steel Institute, Sheffield Society of Engineers and Metallurgists, and by numerous firms interested in the various industries represented.

* * * *

Rand Power Supply. An interesting paper on the power supply to the gold mines on the Rand was read in mail week before the Institution of Electrical Engineers by Mr. A. E. Hadley, the Managing Director of the Victoria Falls and Transvaal Power Company, Limited. The paper described the work of that company, which is stated to be supplying the largest amount of power of any undertaking in the Empire, not excepting the Canadian power stations at the Niagara Falls. The great demand for power on the Witwatersrand has arisen through the extraordinarily successful development of the gold mines on the reef, which, although only discovered in 1886, now produce 33 per cent. of the world's output of gold. The chief mining groups, with the exception of two who had already established their own private stations, have contracted with the company for a power supply for periods of 20 and of 12 years. The supply is furnished to all mining consumers at 2,100 volts and 525 volts. The necessary step-down transformers and switchgear are provided by the Power Company, while the consumer supplies the sub-station building and pays the Power Company a sum equal to 2 per cent. of the power bill to cover the losses in the step-down transformers. The standard price in mining contracts covering not less than 12 years is 0·515d. per unit, as long as the monthly load factor is above 70 per cent., the load factor being based on the hour of maximum consumption. This price is subject to periodical revision depending upon the cost of production, and further, a participation with the consumers in the profits of the business after a due return has been paid on capital is also provided for. In case of failure of supply the consumers are entitled to a payment from the Power Company of 7s. per hour for each 100 k.w. put out of commission. The introduction of these prices on the Rand has reduced the cost of power to the mines by 40 per cent., and has reduced the cost of production of gold by an amount varying from 6d. to 1s. per ton of ore milled.

* * * *

The Nigel. A year ago the shareholders in the Nigel Gold Mining Company were notified by the manager that they had to look forward to the reduced profits of £4,000 per month, owing to the poorer value of the remaining accumulaed slimes, the increased cost of native labour, and the smaller number of stoping faces consequent upon the shrinkage in the ore reserves. The revenue account for 1912 shows a surplus of £49,500 subject to profits tax, so that the manager's estimate has proved pretty near the mark. Actually the gross income is nearly £22,000 higher at £235,500, for the company was able to crush an additional 22,050 tons of ore. But there was a falling off in the quantity, and a still greater drop in the value, of the old sands treated, last year's tonnage being 13,450 for an average of 2·3 dwts., as against 16,000 tons yielding 4·7 dwts. in 1911. Thus, although the yield from current ore—6·8 dwts.—was practically the same for both periods, the net revenue last year benefited to the extent of £1,300 only. In 1911, it may be recalled, the company set aside £1,000 per month towards redemption of extraordinary capital expenditure; £1,700 cost of boring was written off, and after payment of dividends totalling 15 per cent. (calling for £33,500), a balance of £24,500 remained to be carried forward. In June last year the Directors announced a change of policy in regard to this capital expenditure, deciding to clear it off by utilisation of all the profits in excess of 5 per cent. each half-year. Prior to this decision three monthly appropriations had been passed through the books, and so the figure in the appropriation account. After providing for the two 5 per cent. dividends, and allowing £18,300 for depreciation, the increased balance of £33,000 goes forward.

* * * *

Position at the Mine.

The development results of the Nigel are disappointing, there being a marked increase in the percentage of unpayable material. In all 8,880 feet of development was performed, or 1,450 feet more than before, and the quantity of ore opened up totalled 212,000 tons, an increase of 114,000 tons. But as nearly as possible one-half of the year's ore proved below the payable limit, which is fixed at 6 dwts.; whereas of the 128,000 tons disclosed in 1911, some 74,000 tons, or 56 per cent., was pay stuff. Consequently, notwithstanding the increased amounts of underground work, the ore reserves at 179,000 tons are 12,000 tons less than before. The developed ore worth less than 6 dwts. now stands at the large total of 628,000 tons. In concluding his report the Manager observes: "The general position at the mine is much better than at this time last year, and I am convinced that the ore exposed at present and which will be developed during the curren year will enable an average profit of £1,000 per month to be maintained." As in the event of this forecast being justified by results the outstanding liabilities will be paid off by 30th June, the company should be able to pay more than 5 per cent. for the second half of the year. But the outlook further ahead is doubtful.

* * * *

Native Deposit and Remittance Agency.

Under regulation published in the *Union Gazette*, in connection with the Native Labour Regulations Act of 1911 provisions are made relative to the establishment of a Native Deposit and Remittance Agency at the Rand, provided for under Section 23 of the Act. The head agency will be at Johannesburg, and sub-agencies will be established at such centres as are deemed necessary. The deposit section is instituted to enable natives to deposit their earnings for safe custody with the Government, and a native may deposit any sum of 10s. or over. No fee is payable by natives in respect of such monies. A pass-book is issued to every depositor, which must be produced when a deposit is made or withdrawn. The pass-book will bear the depositor's left thumb-print impression, and the impression of the left thumb-print is to be considered the signature of any native. The remittance section of the Agency is instituted to enable natives to remit their earnings to relatives and friends at their homes through Government channels. Such remission may be made throughout the Provinces of the Union, Basutoland, Swaziland, Bechuanaland, Rhodesia, or any other British territory, if arrangements are so made, free of charge. The necessary steps to advertise the Agency will be taken by the Controller.

* * * *

Industrial Census.

A letter from the Acting Director of Census, dated January 8th of the present year, is published stating that the industrial statistics collected in connection with the 1911 Census cannot be considered reliable. Many of the returns were unsatisfactory, and, judging from the totals, a number of establishments have been omitted. The point that suggests itself, says the *Cape Times*, is whether this official communique is to be taken as referring to the returns which are now issued as a Government Blue-book. *Prima facie*, as we have seen, there is strong reason to suppose that there is something radically wrong with the Cape figures. If the belief of the Census Department is that the figures collected are inaccurate, and if this remark applies to the Cape returns, why publish them at all? Surely misleading statistics are infinitely worse than no statistics at all. The points on which information seems highly necessary are, whether we are to regard the published returns, so far as they relate to industries, as in any sense reliable; and if they are not reliable, why they have been issued. They are points of sufficient importance to call for Parliamentary investigation.

TOPICS OF THE WEEK.

THE YEAR WITH THE W.N.L.A.

Mr. John Munro, who presided at the annual meeting of the Witwatersrand Native Labour Association on Thursday, had a very satisfactory story to tell regarding the operations of that important organization during last year. Despite the many criticisms levelled at it of late, the W.N.L.A. is essential to the successful working of the Rand, and its reports are of interest to every worker, or shareholder, in the mining industry. The recruiting figures Mr. Munro laid before the meeting are already familiar to students of the past year. The recruiting operations directly under the control of the W.N.L.A. in the various Portuguese Territories south of latitude 22 degrees south brought in 45,549, being an increase of 4,655 over those of the previous year. Seventy-seven per cent. of the natives recruited during 1912 had previously worked on mines, a fact which Mr. Munro claimed as a true indication of the popularity of mine work among these natives. The natives recruited from tropical areas, that is, from districts north of latitude 22 degrees south, totalled 17,071, as compared with 15,194 during 1911. Owing to famine in the recruiting districts the health conditions of these natives on arrival have been far from satisfactory, but in spite of this, the death rate among them shows an improvement over that of previous years. The total number of natives recruited by the Association and its members from all sources of supply was 247,477, as compared with 208,358 for the preceding year. In both cases natives engaged locally are included, the number for 1912 being 91,590, as compared with 70,223 in 1911. During the year 1912 the fees collected by the Association were charged at the same rate as in previous years, but the rebate for the year is at the rate of 17 per cent. as against 20 per cent. for 1911. The principal reasons for the reduction are that as a more strict examination is now made at Ressano Garcia, the general expenditure is increased, as a much larger number of unfit natives have been returned to their homes before allotment. The question of health continues to engage the serious attention of the Association, and Mr. Munro reviewed in detail the steps being taken to improve conditions on the mines, to encourage research work and to keep this aspect of the native labour question in the forefront of industrial questions. Later in the year we may expect the report of Sir Almroth Wright; and in the meanwhile the new Medical Research Institute, financed by the W.N.L.A. is making good headway. In this connection the return of Mr. Samuel Evans to the Rand from Panama, where he has been making a study of the health conditions is of interest. Indeed, one of the most gratifying features of the industry of late has been the great awakening that has taken place in regard to the scientific study of health questions, concerning both white and black labour. In that study, as affects natives, the W.N.L.A. has played a prominent and useful part.

CAPITAL FOR SOUTH AFRICA.

The destination of new capital raised on the London money market during 1912 is of interest to us in South Africa. The total sum raised during the year was £210,850,000, an increase of about nineteen millions sterling on the preceding year, but a decrease of fifty-seven millions sterling on the exceptional year, 1910. Of the total sum thus raised, forty-five millions were applied in the United Kingdom; seventy-two and a half millions in the British Possessions, and nearly ninety-three millions sterling in foreign countries. As regards the British Dominions, Canada continues to absorb a largely preponderating share of the capital issues—more, in fact, than the amount recorded for all the other Dominions and British Possessions put together. Canada absorbed nearly forty-seven millions sterling; in 1911, forty-one and a quarter millions; and in 1910 nearly thirty-seven millions—about one hundred and twenty-five millions in three years. In the same three-year period capital to the amount of slightly over thirty millions has flowed into the Commonwealth; about twenty-seven millions into India and Ceylon; thirty-six millions into "other British Possessions," and eleven and a half millions into South Africa. By far the greater portion of capital applications in South Africa during recent years has been in respect of mining. Last year, out of new capital raised and applied in South Africa to the amount of £3,862,000, rather more than £2,411,000 was for mining purposes. In the preceding year mining enterprise appropriated practically four millions of new capital, raised in London, out of £4,387,000. The figures emphasise the point that there is a notable dearth of capital available for new enterprises in South Africa, and that every effort should be made to attract, and not to repel, the introduction of such fresh capital. They also point the wisdom of raising the new Union loan in London and not internally as some short-sighted people urged.

THE GROWTH OF MINING.

In the presence of a large and representative assembly of members of the Institution of Mining and Metallurgy in mail week, Mr. Bedford McNeill delivered his Presidential Address, which was worthy of its author and of the occasion. The President, in his Address, first dwelt upon the tendency of the mining engineer and metallurgist to limit himself to the narrow boundaries of the mining, or the treatment of the ore of that particular metal with which his life's work may have been associated, but he pointed out the manifest advantages of taking a more extended view of the influences and uses of metals, as a whole, in our complex civilisation. Two factors never to be lost sight of were the speculative nature of mining and its close association with capital. Of course, mining must always be speculative, and will become more so as far as its initial operations are concerned. Surface deposits, the President thinks, are being worked out, and the ultimate resource may be the working of that class of mineral occurrence which presents no visible evidence whatever at surface, and will demand higher technical skill and involve greater risk of loss of capital than now. He, therefore, contends that each successive advance of the science of mining ought to tend to equalise its increasing hazards. In Mr. McNeil's belief, " the outstanding feature of progress for the last 33 years is to be found in the enormous expansion of mining, and the corresponding increased production of metals." This rate of progress has been much accelerated in the past 10 years, and he gives some remarkable figures in proof of his assertion. The relationship between gold and silver, also come under the President's observation. In 1901, the production of silver was 5,300 tons, and, in 1911, 7,500 tons—an increase of 41 per cent. The production of gold in 1901 was 380 tons. In 1911 it was 680 tons—an increase of 79 per cent. The address is full of statistics into which we must resist the temptation of being led. Thus far, however, we can go in stating that £653,000,000 sterling was added to the world's stock of gold for the 358 years from 1493 to 1850, whereas, for the first 11 years of the present century, this figure has already been exceeded, because the total output has been £867,000,000. Mr. McNeill's figures with regard to the production of silver are startling, and go far to explain the fall of price in recent years. The average annual production between 1831 and 1840 was 19,000,000 ozs., but in 1911 alone it was 252,000,000 ozs.—the ratio in the period 1901-10 being as ten to one for gold. The largest producers of gold are the Transvaal, the United States, Australasia, Mexico and Russia, and the largest producers of silver are Mexico, the United States, Canada and Australasia. The address as a whole will form a notable addition to the literature of mining.

THE WORK OF THE GEOLOGICAL SURVEY.

After three strenuous years on the Witwatersrand Dr. Mellor, of the Geological Survey, has sailed for England, where he will spend a well-earned holiday. His harshest critics would scarcely attempt to deny that Dr. Mellor's work has already borne most valuable results and that in the years to come it will be productive of much more. Dr. Mellor's has been no easy task. As a matter of fact, it has been one of exceptional difficulty throughout. In announcing his interpretations of the geology of the Witwatersrand he has had to be most careful and painstaking, even in regard to comparatively unimportant sections of country, for there is scarcely a square mile of the Rand which has not been made the particular and especial study of some geologist, professional or amateur, and having regard to Dr. Mellor's responsible position it would be fatal to have to admit any real discrepancy in the mapping of even a seemingly unimportant section. It is to the credit of Dr. Mellor that although several of his views have been disputed the main fabric of his geological thesis remains unimpaired, and we believe that it is now recognised that Dr. Mellor's reading of the geology of the Witwatersrand must stand as the most detailed, exact and careful investigation that has been carried out. As a matter of fact, the investigation conducted under the ægis of the Government Geological Survey is the only detailed and comprehensive examination that so far has been made. In the early days of the Witwatersrand Walcott Gibson attempted to determine the value of a number of important geological factors in the Jeppestown and Bezuidenhout Valley areas. In the nineties, too, De Launay, Hamilton Smith, and others gave much consideration to the geology of the Witwatersrand, but their investigations were rather those of mining engineers and their searchings in the direction of determining the conditions under which bankets were deposited and given their auriferous contents rather than the systematic and correlative mapping of stratigraphical features. Carrick and Hatch on the West Rand, and Hatch in the more Eastern section of the fields, carried out important investigations. These, too, however, were investigations of sections, and although it is far from our purpose to depreciate the painstaking work carried out by these gentlemen, it is now seen that in some important particulars the premises upon which they built up their fabrics were at fault. Dr. Mellor has, of course, concentrated all his experience and knowledge on the various problems of the geology of the Witwatersrand. He has located faults where previously no zones of stratigraphical disturbance were supposed to exist, and he has attempted a systematic examination of the Rand beds and their correlative values on lines much broader and more thorough than previously have been attempted. We have heard it remarked that Dr. Mellor's investigations, valuable as they have been, have not resulted in the throwing of any really new light on the subject of his enquiries. It has been stated that in their private reports the consulting engineers of the various "Big Houses" long ago forestalled the findings of the staff of the Geological Survey. Of the accuracy or otherwise of this view it is difficult to decide. For all the labours of Dr. Mellor and others we cannot think that the field for exploration and research is a narrow one, or that the scope for expressions of new views and new opinions is small and circumscribed. It is, as a matter of fact, abundantly clear that there still are many new things to be ascertained regarding the Witwatersrand, and many questions that still await a satisfactory solution. To turn to another branch of geological investigation in South Africa, it is of interest to learn that in Southern Rhodesia Mr. H. B. Maufe and his assistants are continuing their investigation of the many extremely interesting characteristics of that highly mineralised country. So far, the Rhodesian Survey has issued about half-a-dozen brochures, mainly on the Selukwe district and the Victoria tin fields. As we remarked at the time, the latter would have been much more interesting and valued had they been issued at a time when interest centred in that area and not at a time when claims were being abandoned and practically no attention was being paid to the field in question. In the future the Survey will, no doubt, give more time and consideration to the various small mining districts of the country in which large numbers of small quartz reefs exist. A district such as Hartley should, for instance, afford abundant scope for investigation on important economic lines. Although there is still a great deal to be investigated and found out in regard to the Transvaal, it must be abundantly clear that far greater scope for discovery exists in Rhodesia, the major part of which is still an absolute *Terra Incognita*, and if the Geological Survey of that country does not bring to light a host of important new facts it will be cause for surprise and disappointment throughout the country.

THE CIRCULAR SHAFT AT THE NEW MODDERFONTEIN.

Reasons for the Work—Operations Described—Excellent Returns as Regards Costs and Speed.

Owing to the favourable development results that were being obtained, and their continuation in depth, especially the excellent values proved in the eastern area in the neighbourhood of Nos. 10 and 12 shafts, and in consideration of the large area of unworked claims, it was decided late in 1910 to prepare gradually for a general expansion of the New Modderfontein company's mining operations. In order that the mine should deal with a considerably increased tonnage a new shaft was started, situated at the southern end of the property, and commanding the proposed workings of the deeper levels. The capacity of the shaft will be considerable, as it has been decided to raise a load of six tons per trip, and it is reckoned that the time required for loading, hoisting, and off-loading will not be more than one minute per trip. For economic reasons the ordinary practice of these fields was departed from and a circular shaft 18 feet in diameter was sunk, reef of good value being cut at a depth of 2,158 feet. The chief reasons that prompted the sinking of a circular shaft were ventilation, cost of sinking and maintenance. The shaft being circular and walled throughout is free from all obstructions, and it must be admitted that this allows the maximum free air space for ventilation purposes. The cost of sinking (including walling) has also proved cheaper.

Looking Down the Shaft.

Costs and Rates of Sinking.

As the permanent equipment of the shaft simply consists of steel rope guides and no timber, it can well be understood that the cost of maintenance will be practically nil. Various estimations placed the depth at which reef would be encountered at between 2,150 and 2,300 feet, subsequent events proving these estimates to be reasonable, the reef actually being cut at a depth of 2,158 feet. Sinking was started on January 2nd, 1911, the reef was cut on October 29th, 1912, and shaft sinking was stopped November 16th, 1912, the shaft then being 2,258 feet deep. Sinking and walling therefore took place over 22½ months, or at an average monthly speed of almost exactly 100 feet—walling and sinking being done alternately. The cost of sinking averaged £14 9s. 5d. per foot, and of bricking £7 12s. 2d. per foot, or a total of £22 1s. 7d. per foot. The total cost of the surface equipment, exclusive of quarters, amounted to £30,077. To start with, a pilot shaft was sunk through the overlay, and was stopped in solid rock at a depth of 71 feet. The equipment for this shaft, consisting of a winch, a derrick and a kibble, is not of sufficient importance to warrant description. The next proceeding was to widen the pilot shaft, and a very solid concrete collar—at no place less than three feet in thickness—was put in. Whilst this work was in progress, the equipment for sinking the shaft was being installed. A double headgear was erected so as to facilitate the arrangement of the numerous ropes required for hoisting rock and water, and for lowering guide ropes, the sinking platform, pipes, cables, etc.

The Shaft Equipment.

Shed "A" contained the main sinking engine, an 18in. by 36in. single drum Tangye hoist, which was run unbalanced with its load consisting of a 37 cubic foot kibble, bridle rope, etc. A 10in. by 12in. single drum hoist was used for raising and lowering the sinking platform, and for lowering the two guide ropes. In this shed was also a 120 h.p. Bellis and Morcom high speed engine belted to a dynamo from which was generated the electricity required for lighting purposes and for an electric pump. In addition, a small air compressor was erected for running machine drills at the bottom of the shaft. To the west of Shed A was the boiler house containing three 250 h.p. Babcock and Wilcox boilers, and off this a small change house.

The Shaft, Showing Cribbing.

At the Bottom of the Shaft.

In Shed "B" was erected a double drum 16in. by 48in. Ruston Proctor engine to be used in case of necessity for baling water. Fortunately little water was encountered and this engine was never used. In front of this engine was a 12in. by 20in. Tangye geared hoist used for handling the electric power cable, pipes, ventilation column, and sundry timber. In this shed, partitioned off, was a small room containing an electric fan to supply the ventilation column, and also partitioned off a fitting shop containing the few tools required for executing minor repairs. To the west of this was a shed containing the smithy, a store, coal bunkers, etc.

The above brief description of the machinery will serve to show that the shaft was fully equipped to deal with whatever difficulties might be encountered, especial precautions being taken to deal with any influx of water that might occur. As it happened these precautions proved unnecessary, but from the history of neighbouring shafts it was thought possible that a large quantity of water might have to be dealt with. A small fan connected to a two-foot column provided ample ventilation, and kept the atmosphere at the bottom of the shaft fresh. The solid quality of the work can be well judged from the solidity of the collar, the concrete in no place being less than three feet in thickness, and widening at the corners to nine feet. The fact that the shaft will be required during the life of the mine, and will shortly become the main shaft, leaves no doubt that money spent on making a good job will not be wasted, and further, the cost of maintenance must be less than would be incurred otherwise. The concrete collar, and surface arrangements, being completed, a start was made at sinking proper on January 2nd, 1911. The pilot shaft was widened out to its full dimensions, and in order to keep up the sides of the shaft temporary cribbing was resorted to. This cribbing is best shown in photograph No. 2, the man on the side being the master sinker who had charge of the shaft from top to bottom. Crib rings were put in every four feet and were close lagged, the size of lagging being 5ft. by 9in. by 1½in. On reaching the bottom of the pilot shaft the first curb ring was put in position, and the shaft was then bricked up to the concrete collar. To start with, a layer of cribbing would be removed, and the shaft lined with watertight walling. Concrete, consisting of 6 stone, 1 sand, 1 cement, was grouted in behind the bricks, the amount of grouting naturally depending on the smoothness and regularity of the excavation. Accompanying photographs give some idea of the work. Down to the second curb, 100 feet down, the bricking was two feet thick, and was then reduced to one foot. The bricks used were good well burnt bricks of standard size, and were bonded together with a mixture of 4 of sand to 1 of cement. For the men to stand on during bricking a circular platform was used; this platform was made to the size of the shaft in two halves, and worked very successfully. When the brickwork reached the collar, the shaft was cleared for sinking and was sunk down to the second curb. The shaft was alternately sunk and bricked to a depth of 1,600 feet, and was then sunk to its final depth, bricking being completed later. The bricking was in charge of the master sinker and the day was divided up into three eight-hour shifts. On each shift were employed the sinker and his helper, two masons, and six natives, a good shift bricking up to nine feet. On reaching a depth of about 700 feet, concrete blocks were used in place of bricks. These blocks were made on the property and were shaped to the shaft. In sinking operations the shift consisted of the master sinker in charge, the leading sinker, his helper, and native crew. The day was divided up into three eight-hour shifts, 6 a.m. to 2 p.m., 2 p.m. to 10 p.m., 10 p.m. to 6 a.m., these times being adhered to very closely.

THE ROUTINE OF SINKING.

To take a typical shift:—At 6 a.m. the night shift is sent up with the exception of the leading sinker and his helper who stay behind to light up. After lighting up, these men ascend and report to the succeeding shift any matter of interest, such as loose rock in the shaft, a misfired hole, or any change in the ground. Meanwhile the rigger, or failing him the master sinker, examines the bucket and its attachments, and has a look at the collar doors. Of chief interest in the attachments to the bucket is the rider, which in the case of an over wind is opened automatically, and becomes out of action, allowing the King safety hook to pass through its supports and hold the bucket. The collar doors are also interesting as they were steam operated, and were opened and closed without any exertion on the part of the banksman. After allowing sufficient time for the fumes to become dispersed, the leading sinker and his helper go to the bottom, and are followed by their shift of natives. The next process is to muck out the dirt broken by the preceding shift. The amount of rock broken per shift naturally varied, and as a rule if one shift broke an unusually large amount, the succeeding shift would be a poor one owing to the time taken in mucking. A fair average shift would break about 30 to 40 buckets or a little under 60 to 80 tons, and this would take 22 boys two to three hours to clean up. At 27 tons to the foot this represents a footage of two to three feet per shift.

The shaft was making a little water but not sufficient to warrant baling skips being used, the ordinary bucket being filled by hand and tipped into a runway on the surface. Several small feeders were passed through but these were successfully kept back by close walling the shaft where encountered. After cleaning out, the leading sinker would place his holes. In the centre were the cut or sump holes—six holes were drilled around an eight foot circle and pointing towards the centre of the circle. Around this was the second lot of 10 holes drilled around a sixteen foot circle, i.e., four feet from the cut holes, and finally about sixteen holes were used to round off the sides. In all about thirty-two holes were drilled per shift. This latter operation took about four hours, the remaining hour of the shift being occupied in charging up and blasting. After the shaft got well away machine drills of the small type were used successfully. At a depth of 1,000 feet a chamber was cut in the side of the shaft and arched in order to catch all water made above this level. The sump was capable of holding 35,000 gallons, and a three-throw pump was installed. From the foregoing it can be seen that shaft sinking operations were carried on most successfully, both as regards cost and speed, and the expenditure connected with maintenance should be reduced to a minimum.

Rand Nucleus.

In moving the adoption of the report and accounts for the year at the annual meeting of the Rand Nucleus G.M. Company on Friday, the Chairman said that no developments had taken place in the district during the year, and nothing important was likely to occur until market conditions improved.

A New Copper Mine.

The Otavi mine is no longer the only producing mine in German South-West Africa. According to the journal *Südwest*, the Khan copper mine, on the Khan river, has entered the producing stage after having been opened up down to a depth of 160 m. The result of the development work, especially during the last year, is stated to have been very encouraging. The visible ore reserves guarantee considerable working profits and a long life. A large up-to-date ore-reduction plant is being erected. The water required for the works is pumped up from the Khan river through a pipeline of a length of 18 kilometres. Electric power will be generated at a large central power station now in course of erection. The works are connected by a private line with the railway station at Arundis. The reduction works are planned for a treatment of 50 tons of ore per day. It is expected to start work at the beginning of 1914.

Kolmanskop Diamonds.

The annual meeting of the Kolmanskop Diamond Mines (German South-West Africa) was held in Capetown on Saturday morning. The directors' report stated that they expect much benefit will accrue through participation in the Diamond Regie, on the board of which they have two representatives. The profit for the year was £39,146. The directors proposed to place £4,000 to reserve, bringing the fund up to £20,250. An interim dividend of 10 per cent. was paid in August, 1912, and the directors recommend a further dividend of 20 per cent., the same as last year.

SIMMER DEEP AND JUPITER MEETINGS.

The Year's Work at Two Great Deeper Level Mines—Proposals to Increase Equipment.

The principal features of interest in the speeches of Mr. D. Christopherson, at the meetings of the Simmer Deep and the Jupiter, were the announcements that in view of the low grade recovery and general positions of these two properties the reduction and treatment plants will be increased. At the Simmer Deep the question of increasing the capacity of the plant up to 75,000 tons per month is being considered, and in the words of Mr. Christopherson " will no doubt be carried out immediately it is thought opportune to do so."

Proposals as to Increasing Equipments.

Continuing his remarks on this important matter, the Chairman declared: " You will no doubt remember that in 1910 it was reported to you that the Board had decided to increase the plant up to a capacity of 72,000 tons per month, whilst in 1911 you were informed that, in view of the continued shortage of native labour, it was decided to revise this decision and make the capacity 65,000. Owing to the improved position of the native labour supply your Board consider this further increase is now justified, but, in view of the annual debenture liabilities which have to be met, it is necessary to be most careful before authorising capital expenditure, and therefore until the Board feel more assured that there is a sufficient water supply to carry on milling operations uninterruptedly during the current year they do not for the moment feel justified in encroaching on the cash reserves for the purpose of meeting this expenditure." At the Jupiter it is intended to increase the capacity of the crushing and treatment plant up to 60,000 tons per month with a view to reducing costs to a figure which will admit of ore of a mine grade of 4·1 dwts. per ton being treated at a profit.

The Simmer Deep's Year.

At the Simmer Deep meeting Mr. Christopherson, who presided, stated that the operations of the company for last year resulted in a working profit of £35,546, to which has to be added an amount of £16,548 on account of sundry revenue. After deducting from this amount debenture interest and expenses, depreciation and assessment in respect of miners' phthisis, a net loss of £4,230 is recorded. The present position of the mine is concisely summed up by Mr. C. D. Leslie. The fully developed ore reserves a year ago were estimated to be 1,312,000 mill tons, of an average mill value of 4·9 dwts., which is equivalent to 1,469,719 mine (or unsorted) tons of an average value of 4·4 dwts. The estimated reserves at 31st December, 1912, are 1,430,693 mine tons, fully developed, of an average value of 4·2 dwts. per ton, and 144,296 mine tons, partially developed, of an average value of 4·08 dwts. per ton. Mention was made in last year's report of the policy to be pursued of exploiting the large area west of the Milner shaft, and during the year now under review a large proportion of the development work done was in that section. Whilst the improvement was not at first appreciable, the results latterly attained have been encouraging, and make it reasonable to hope that not only will large areas be proved payable in this section, but that, towards the Jupiter boundary, ore of above average value of the reserves will be encountered in the Main Reef Leader. As compared with the previous year, 52,950 more tons were treated; the average recovery was 17s. 6·661d. as against 18s. 8·916d., and the working cost per ton was 16s. 4·315d. as against 16s. 7·757d., the net result being a working profit of £35,546 8s. 7d., or £21,237 11s. 2d. less than for the preceding year. There has been very little change in the general position since the last annual report, except that the expenditure incurred and close attention given during the year under review towards securing improved health conditions underground are having satisfactory results, the good effects of which should become apparent in better efficiency in the future. The average number of natives at work was only increased during the year by 392, but there is a decided tendency towards an improved native labour supply, and it is hoped that the mine will soon be operating on a larger scale. In a mine like the Simmer Deep, where the ore contents are of consistently low grade, the policy must be to secure large tonnage and low working costs, and it is very regrettable that the conditions prevailing during the year made it impossible to carry out this programme. A feature of the year's work has been the reduction effected in working costs. Especially during the last six months of the year was this noticeable. The following figures show how, during the last six months, the costs have decreased as the tonnage was increased, more especially when the increase in the tonnage was considerable:—

	Tonnage Crushed.	Working Costs
September, 1912 ...	52,000	15s. 9·3d.
October	55,200	15s. 5·7d.
November	51,400	16s. 3·1d.
December	52,950	15s. 10·7d.
January, 1913	61,350	14s. 5·5d.
February	60,150	14s. 4·2d.

Dividends from the Jupiter.

The sister deeper level adjoining the Simmer Deep on the west is a property possessing the distinction of being one of the deepest gold mines in the world, a vertical depth of approximately 5,000 feet having been attained in the deepest workings. Having regard to the working depth and the low grade value of the ore reserves (the estimated fully developed reserves at the end of 1912 were 1,270,000 "mine" tons of an average value of 4·4 dwts.), an increase in working profit of over £30,000 for the year must be accounted very satisfactory. This improvement was effected by reducing the cost of working by no less than three shillings per ton. The recovery value was lower by 2s. 4d., but the resultant improvement in profit of 8·24d. per ton combined with an increase of 161,800 tons in ore milled enabled the mine to earn a substantially larger aggregate, and to distribute £50,710 (5 per cent.) amongst shareholders in the form of dividends. In connection with this company's report, the outstanding features, in addition to the decline in costs and improvement in profits, are (a) declaration of ore reserves on a different basis to that previously adopted; (b) the decision to increase the capacity of the plant. As to the first the report of the Directors states:—It will be noticed that in the Superintending Engineer's report the values of the ore reserves are given as mine grade instead of, as in previous years, milling grade. The reason for this change is due to the fact that previously in arriving at the milling value of the reserves, a 10 per cent. sorting allowance was provided for. Your engineers advise that experience indicates that it is not practicable to sort up to this extent. It is therefore felt that to continue giving a milling grade of the ore reserves might be misleading to shareholders. In view of the falling off in values as shown in the development carried out during the year, your Board have decided to increase the capacity of your crushing and treatment plant up to 60,000 tons per month, whereby it is anticipated that working costs will be reduced to a figure which will enable ore of a mine grade of 4·1 dwts. to be treated profitably. On the subject of development Mr. C. D. Leslie, the Superintending Engineer, remarks:—The ore developed during the year was of less average value than that of the existing reserves, but this should not be regarded as particularly discouraging, since most of the development for the period was on Main Reef where values are known to be below the average, and crosscut raises therefrom to develop the Main Reef Leader may prove the existence of ore of increased value.

Expenditure to Date.

It is interesting to note the amounts expended by these two mines on capital and extraordinary expenditure accounts to date. The figures are: Simmer Deep, £2,115,579; Jupiter, £1,048,602.

THE SERIOUS OUTLOOK FOR THE RAND'S WATER SUPPLY.

The Government's Attitude in Regard to Gemsbokfontein.

The rains of the past few days have been most satisfactory, but the season is still the worst on record. A well-known mining man connected with the industry remarked to a representative of this paper during the week: - "Unless another six inches of rain fall before the end of the season, the position on the Witwatersrand during the winter months will be a very serious one indeed." The rains that have fallen in Johannesburg during the last few days are exceptional for this time of the year. The record is taken at the Observatory every morning at 9 o'clock, and the figures for the three days—the 29th 30th and 31st—are as follows:—March 29, ·94 inch; March 30, ·07 inch; March 31, ·74 inch. The nature of the rain was entirely satisfactory. Each day was dull, and the water was therefore given a chance to run off into mine dams and natural storage places underground. The total rainfall during March, as registered at the Observatory, was 4·47 inches, and there were falls on 15 days. This is higher than the average for March by ·56 inch. The average rainfall for the season from July 1 to the end of March, reckoned over a period of the last nine years, is 25·50 inches. During this last season, now just closed, the total has been only 17·64 inches, so that there is now a deficit of 7·86 inches on the average. Questioned as to the likelihood of further rains, Mr. R. T. A. Innes, the Director of the Union Observatory, remarked that he thought we should have some more. That opinion was based only on present indications. In previous years a dry April has usually followed a wet March, such as we have had. No logical sequence, however, is to be expected so far as the weather is concerned, and good rains during April and May are hoped for. Still, such a condition of things would be unusual—it is seldom that there are satisfactory rains after March. Last year rain fell on 12 days in April, the total being 2·93 inches; but in 1908, for instance, rain fell on one day only in that month, the amount registered being ·07, and two months without any rain at all followed. In any case, the position is one that gives cause for considerable anxiety, and whilst there are many who hold to the view that the period of rains is getting later each year and that we may yet expect a substantial addition to the fall, the situation is certainly such as should occasion the very fullest forethought, and the provision of adequate supplies or reserves. The outlook for the future is most certainly not improved by the attitude taken up by the Government. The Rand Water Board in the report of the deputation to Capetown brought home—or at any rate should have brought home—to the Government the seriousness of the position. The Water Board, too, offered most liberal pledges to secure farmers against deprivation of water in their areas, and the refusal of the powers that be to assist the Board in turning to most useful purpose the surplus water issuing from the Western Rand Estates shaft on Gemsbokfontein is extraordinary. To the south-west of Randfontein the aqueous dolomites extend over a large extent of country, and it is difficult to see how the pumping of water from Gemsbokfontein would deplete the supplies of the Mooi River. Experience in other portions of the dolomite area has shown that boreholes, shafts or wells only exhaust certain limited areas. Exhaustion is very localised, and we believe that the water question could be solved in this section of the Witwatersrand area without damaging the interests of anybody. In the event of the Government not modifying their attitude in regard to Gemsbokfontein, the obtaining of supplies from other sources will have to be very thoroughly considered. The water areas of the Further East Rand are capable of relieving the situation to a considerable degree, but even with liberal assistance from these the position will be one of grave anxiety. Whether a further six inches of rain will fall this season or not is, of course, impossible to say. But if hopes in this regard do not materialise it is certain that either the Government will have to modify the preposterous attitude it has taken up or else the largest and most important industrial area of South Africa will be face to face with a most serious position.

THE POSITION AND PROSPECTS OF THE WOLHUTER.

Points from Chairman's Speech—Progress Since Issue of Annual Report.

In our issue of January 18th last the annual reports of the Wolhuter G.M. Co. were very fully dealt with. The annual meeting was held last week and Mr. A. G. Gill, the Acting Chairman brought down to date the published particulars of progress at the mine. The result of the year's work has been expresed in the payment of two dividends, of 8¾ per cent. each, amounting in all to £150,500—and the increase of the ore reserves to 832,977 tons, having a value of 6·48 dwts. over 50 inches. The values disclosed in the various sections of the mine continue to be quite satisfactory—for instance, in the lowest level of the mine there is a stretch of 1,590 feet, going west, averaging 9·2 dwts. over 50 inches, and there is every reason to believe that the remaining 320 feet still to be driven on this level before reaching the western boundary will also be found to contain highly payable ore. In this connection, and as it has a bearing on the future prospects of the property, Mr. Gill mentioned that the development work in the City Deep, which adjoins on the south, is disclosing ore of excellent value, whilst at the Meyer and Charlton, which adjoins on the west, exceptionally high values are being obtained in the lowest levels in the mine. Mr. S. C. Thomson, in his report, refers to a new electrically driven compressor of 38 drills capacity, that has been ordered and will be erected shortly. The compressor, together with the necessary piping, will cost £5,650. The money will be well spent, however, since, in Mr. Thomson's opinion, it is going to make the mine practically independent of any future shortage of native labour. A further improvement is expected through an increase in the capacity of the cyanide plant, at a cost of £2,650. This expenditure is being incurred primarily to obtain a better extraction, but the enlarged cyanide capacity will, without additional expenditure, also give the whole reduction plant an increased capacity by a few thousand tons per month. Mr. Gill concluded by saying: "Now I intend to refer briefly to what has taken place since the close of your financial year. Unfortunately the profits have been decreasing; this, together with the unusually heavy capital expenditure, which is being incurred during the current year, naturally must have an effect on the half-yearly dividend to be declared next month, and the distribution will probably be only 6¼ per cent. I have already told you that the development continues to yield satisfactory values, and there is every reason to anticipate improving returns from now on, although the measure of this improvement will largely depend on again encountering more settled ground."

According to the new roll, the value of Johannesburg is £33,333,000, an increas of about £2,650,000 upon the valuation of three years ago. Much of the increase is stated to be due to the higher value of land in the central part of the town, particularly in Eloff Street.

THE MANAGER AND STAFF OF THE BREYTEN COLLIERIES.

Standing (reading from left to right): W. Sewell, junior clerk; G. Christopherson, assistant secretary; P. O. Lange, weighbridge attendant; L. S. Rule, compound manager; J. C. Samuel, surveyor.
Sitting: P. J. Granger, resident secretary; N. J. James, mine captain; W. H. Lewis, manager; J. L. Morland, resident mechanical engineer.

LABOUR AND WAGES ON THE MINES.

The Preponderance of the Witwatersrand—A Diminished White Wages Bill—The Ratio of White and Coloured Labour.

The February statistics of the Mines Department for the Union of South Africa give details concerning the salaries and wages of white employees for the year 1912 which enable us to make a comparison with previous figures of the same kind. The salaries and wages bill for mining and metallurgical operations and for the allied industry of power supply companies (*per se*), throughout the whole of the Union, was for the year under review, £10,304,956. Of this sum, gold mining paid £8,196,353, including the trifling sum of £5,079 from Natal, and diamond mines £1,245,067. Of this last named sum, the Cape mines paid £712,869, the balance accruing from mines in the Orange Free State and the Transvaal in almost equal proportions. These figures demonstrate the enormous importance of the gold mining industry of the Transvaal as a direct contributor to the prosperity of the country. Coming now to an analysis of the sum spent in this way by the gold mining companies, we find that £7,865,939 were paid by the gold mines of the Witwatersrand, £325,335 by gold mines outside the Witwatersrand. If the operations of reef and alluvial diggers are included an additional sum of £44,035 must be made, which brings the total for gold mining in the Union to £8,240,388. Of the former amount, some £39,129 represent the payments made on account of work in the Transvaal.

Native Wages.

In order to complete the data for a review of the whole position, it may be stated that the amount spent in native wages throughout the Union, in 1912, was £8,360,898. Of this sum £5,962,297 was paid by gold mines and £34,967 by reef and alluvial diggers in the Transvaal, the total under this head being thus £5,997,964, of which amount the gold mines in the Witwatersrand area paid £5,691,401. Diamond mines in the Transvaal paid out £588,160; in the Orange Free State, £396,066; and in the Cape, £614,410. In discussing these figures relating to salaries and wages, it must be pointed out that those in respect of lime works and miscellaneous concerns are not yet complete. The total sums referred to include payments at gold mines, reef and alluvial diggers' undertakings, metallurgical works and tailings works, diamond mines, coal mines, base mineral mines, lime and flint works, and power companies (*per se*). Included in salaries is the sum of £53,595 paid to medical officers.

Salaries and Wages: Gold Mines.

We have not the necessary data for making a comparison on the lines of that which was effected in an article on this subject which appeared in our issue of the 21st December last. The following statement covers a period of five years, and refers to sums paid in the Transvaal by gold mines, and reef and alluvial diggers only:—

Transvaal.	Salaries.	Whites.	Coloured.	Total.
Year 1907-8 ...	£959,444	£4,966,972	£4,397,491	£10,323,907
Year 1908-9 ...	1,018,796	5,547,862	4,472,448	11,039,106
Year 1909-10 ..	1,156,319	6,385,164	4,854,007	12,395,490
Year 1911 ...	1,256,406	7,286,108	5,740,933	14,283,447
Year 1912 ...	1,228,584	7,001,819	5,997,964	-14,228,367

A very obvious fact which stands out prominently from this tabular statement is that there has been a falling off in the total sum paid during the past twelve months as compared with that disbursed during the previous year, in spite of the fact that native wages have increased to a material extent. The diminution is evident in salaries as well as wages. The annual reports of the Mines Department do not segregate the wages and salaries statement in the same way that they are dissected in the reports that appear occasionally during the year. The Witwatersrand figures, therefore, are not shown separately in the statement given above. It may be taken for granted, however, that the reductions have taken place mainly along the Rand.

Average Number of Employees.

In view of the position with regard to wages and salaries it is of interest to consider the average number of employees in service at the mines of the Witwatersrand. The figures for the years under review are as follows:—

Witwatersrand Gold Mines.	Total Whites.	Total Natives and Coloured.
Year 1907-8	16,778	143,441
Year 1908-9	18,803	151,544
Year 1909-10	22,095	156,334
2nd half, 1910	23,959	169,852
Year 1911	24,297	173,752
Year 1912 (December)	23,776	200,894
Year 1913 (February)...	23,947	210,397

Although, to the end of 1911 there had been a steady increase in the number of whites engaged on the mines, there seems to have been a tendency, since then, towards a reduction of the number for the figures shown for December and February last are not isolated example by any means. In January, 1912, the averages of white and coloured, respectively, for the month were 25,224 and 198,595, while in June they were 24,901 and 208,713. The tendency, therefore, is sufficiently pronounced to deserve notice. The parallel increase in the number of coloured labourers is also sufficiently emphasised in our table. The result is that the ratio of white to coloured, which was 1 to 9·3 in 1907-8, and 1 to 7·7 in 1911, was increased again in December to 1 to 8·4, and still further in February to 1 to 8·7. We are unable at the moment to explain the causes which have operated to bring about the state of things which is revealed by these tables. The changes have not been accompanied by any improvement in the working cost figures. It must be borne in mind that over 2,400 applications for relief have been made to the Miners' Phthisis Board during the past year, and it is not improbable that some connection may be found between this fact and that of the diminution of the white labour force. That the force has not been recruited sufficiently to maintain the white and coloured ratio, which one would have expected to see lessened rather than augmented, supports the opinion that has often been expressed lately to the effect that good miners are becoming scarce and that new men are not taking freely to the occupation of mining. However this may be, it is clear that the statistics we have quoted deserve something more than a casual reference, and indicate that the position is one that may well bear close investigation.

Contract Earnings and Day's Pay.

In order to extend our review of an interesting subject, the following table, relating to Witwatersrand mines, is appended. The figures explain themselves:—

Classification.	Average Pay per Shift.				
	June, 1910.	June, 1911.	Dec., 1911.	June, 1912.	Dec., 1912.
Shift bosses	24 7	24 8	25 2	26 0	23 8
Timbermen	20 4	20 5	20 10	20 6	20 0
Pipemen	18 11	18 1	19 4	18 10	18 8
Fitters	20 5	21 3	20 0	21 9	20 8
Platelayers	18 4	18 5	18 7	18 5	18 2
Banksmen and onsetters	14 6	14 8	14 7	14 9	14 10
Skipmen	15 9	16 2	15 9	15 11	15 11
Trammers and gangers ...	13 7	13 11	14 0	14 0	13 10
Pumpmen	18 7	18 7	18 9	19 0	18 7
Miners—Machine stoping:					
Contract	27 11	28 10	28 8	27 9	28 1
Day's pay	21 2	22 4	22 3	20 6	19 9
Miners—Hand stoping:					
Contract	23 8	24 5	26 11	24 10	26 6
Day's pay	18 3	18 4	19 6	18 8	18 11
Miners—Machine developing:					
Contract	36 5	38 8	35 4	34 11	36 2
Day's pay	22 2	23 2	20 2	19 8	19 8
Miners—Hand developing:					
Contract	28 5	27 0	27 6	29 6	27 2
Day's pay	19 8	22 9	19 0	18 6	20 2
Shaft sinkers:					
Contract	47 11	54 6	50 5	49 10	44 6
Day's pay	22 3	24 2	25 0	25 9	28 1

For the month of December last there were, on machine stoping, 1,185 men doing contract work and 252 receiving day's pay; on hand stoping there were 674 doing contract work, and 1,336 working on day's pay. For purposes of comparison it may be stated that the corresponding figures for December, 1909, were:—Machine stoping: Contract, 980; day's pay, 329. Hand stoping: Contract, 427; day's pay, 1,066. The extended use of machine drills is thus quite evident. The pay in December, 1909, for this work was machine stoping, 27s. 6d. and 20s. 3d., and for hand stoping 25s. and 17s. 11d. respectively.

Henderson's Transvaal Estates.

The statutory report of Henderson's Transvaal Estates, Ltd., submitted at the statutory meeting on the 17th March, states that the total number of shares allotted is 2,210,236, of which 2,210,229 are allotted credited as fully paid in consideration of the transfer to the new company of the undertaking, assets and liabilities of the old company in accordance with agreement dated 11th December, 1912, made between the old company and its liquidator and the new company, and upon each of the remaining shares the sum of 5s. has been paid in cash. 2,449 shares have still to be issued in respect of unconverted fractions of shares. The total amount of cash received by the company in respect of the shares issued wholly for cash is £1 15s. The receipts and payments of the company on capital account to the 1st March, 1913, are as follows:—Receipts—Farms, stands, mineral claims, buildings, plant, machinery, shares in subsidiary companies, Debentures, stocks, cash and other effects acquired from Henderson's Transvaal Estates, Ltd. (Rhodesia), less liabilities, of the value of £553,169 10s.; amount received on seven shares issued wholly for cash, £1 15s. Payments—Issue of 2,210,229 shares of 5s. each, fully paid, in part purchase of assets, as per contra, £552,557 5s.; 2,449 shares still to be issued (as above), £612 5s.; balance, £1 15s. The preliminary expenses of the company are estimated at £5,000, which are to be paid by the old company.

Sale of Ariston Mine.

We have been asked to draw attention to the announcement regarding the sale of the Ariston mine, plant and buildings, near Klerksdorp, which appears in another part of this issue. The mine is reported to be well equipped and in full going order, and the sale is to be effected without reserve.

Manicaland Output.

The mineral output of the territory of the Companhia de Moçambique (Manicaland) for the month of February, 1913, has been officially announced as follows:—Gold: Reef: Mill: Gold won (fine gold, 399 ozs. 12 dwts. 19 grs.; tons crushed, 1,511, value £1,678 7s. 11d. Concentrates (estimated): Gold (fine gold), 18 ozs. 10 dwts.; tons, 3·5, value £78 12s. 0d.; silver and lead value, £23 16s. 0d. Cyanide: Gold recovered (fine gold), 16 ozs. 13 dwts. 10 grs.; tons treated, 140, value £70.

RANDFONTEIN DEEP.

A West Rand Deep Level with Great Potentialities—A Waiting Policy.

Practically all the large floated mine areas of the Witwatersrand are now under attack, and, so far as first row deep level properties are concerned, the position of the Randfontein Deep is unusual. There are parallels to be found in the French Rand-Loipaardsvlei section of the Rand, in the Florida area, the Boksburg district, and in the case of the Further East Rand at Cloverfield. For a first row deep level mine not yet to have encountered reef in a shaft is, however, a state of affairs which calls for some special remark, and, since the annual meeting of the Randfontein Deep Company has just been held, a short consideration of the affairs of this mine should prove of interest.

Question of Reef Dip.

As is generally known, the dip of the Randfontein reefs is very steep, and hence the depth to the banket series is substantially greater than in the Central and Eastern sections of the Rand. In the first place it should be appreciated that the Randfontein Deep property, in addition to the Randfontein reefs, carries the Horsham and Lindum reefs separated from each other by a parting of about 120 feet of quartzite. These two reefs outcrop at a distance of some 5,000 feet to the east of the outcrop of the Randfontein Leader and some 2,500 feet east of the average western boundary. It was reported in February, 1907, that 1,386 feet sampled on the Horsham Reef showed an average value of 5·69 dwts. over a stoping width of 36 inches. As to the Randfontein, or Main Reef series, it is interesting to learn that this was cut at a vertical depth of 2,730 feet, and at a distance of 490 feet west of the Randfontein Deep western boundary—that is to say in the property of one of the outcrop companies of the Randfontein Estates. It was estimated that this reef lay at a vertical depth of about 2,900 feet in the Randfontein Deep property. The average assay value there struck was quite satisfactory, showing 9·73 dwts. over a width of 57 inches. Two shafts were started up in December, 1909, with the Randfontein series as their objective of attack. These are 3,625 feet apart and 200 feet east of the western boundary of the property. The north shaft is 3,900 feet from the northern boundary, and the south shaft 3,800 feet from the southern boundary. In this latter shaft operations were suspended in March, 1911, when a depth of 1,650 feet had been reached.

Potentialities of the Venture.

As to the operations of last year, Professor J. G. Lawn, the consulting engineer, in his report, writes: "For the month of January the north shaft was sunk 56 feet, at a total cost of £80 17s. 6d. per foot. The water pumped and baled amounted to 21,732,000 gallons. As there was no evidence that we were getting through the fissured ground mentioned in my last annual report, and as the water was constantly following the shaft down as it was being sunk, making the sinking slow and consequently expensive, it began to be doubtful whether the money in hand would suffice to enable the shaft to be sunk to the Randfontein Leader. The directors therefore thought it wise to conserve such funds as remained, and sinking was stopped on the 8th February, when the shaft had attained a depth of 2,083 feet. A 4in. pipe, extending from the collar of the shaft to the bottom, was installed for the purpose of enabling a borehole to be put down, should it be found desirable to do so at a future date. Developments in the neighbourhood of the property have tended to confirm the opinion that this will some day be a successful mine. The West Rand Consolidated has recently located Battery Reef of good value at the southern part of their property, that is near the northern boundary of the Randfontein Deep, and it is understood that the developments in the bottom levels of the southern section of the Randfontein Central mine have been highly satisfactory. It should also be borne in mind that there is a long line of Battery Reef outcropping in your property, and, with the Randfontein Leader at depth, there is no doubt that the Randfontein Deep is a mine with great potentialities."

Having regard to the large claim area of the property, and its favourable situation, it is clear that the Randfontein Deep is a mine of great possibilities. Despite the fact, however, that it is a first row deep, it is a mine that would take some years to bring to the producing stage even with a very active development policy in operation. In the years to come the Randfontein Deep will, no doubt, take a prominent place in the list of the Rand's producing mines.

THE WORK OF THE MINERS' PHTHISIS COMPENSATION BOARD

Returns for Six Months—Some Striking Figures.

The report of the Miners' Phthisis Board for the first six months ended January 31, 1913, states that the number of applications received was 2,413, of which eighteen were from applicant miners oversea, and 124 from oversea dependents of deceased miners. The number of applications under the Act of 1911 was 1,014, of which 759 have re-applied under the present Act. The number of applicants who have submitted claims for the first time under the Miners' Phthisis Act of 1912 is 1,654. The report states that there appears to be no falling off in the number of applications coming forward, in view of the number received during January—namely, 345, or over eleven per day, including Sundays. Of the 2,413 applications received, 1,682 had been dealt with, leaving 731 still to come forward. No awards were made to 76 applicant miners or to 138 applicant dependents of deceased miners, owing to the fact that their cases did not fall within the provisions of the Act.

ANNUITIES.

The Board states that, with very few exceptions, all the applicants for benefits under the Act desire the single payment, and they frequently advance reasons and schemes in support of their request. The Board, however, keeps steadily in view the position of dependents in the event of the early dealth of the beneficiary and the possibility of the scheme advanced being successful, if adopted; for it frequently happens that sooner than may be expected by the beneficiary the management of the scheme will fall into the hands of dependents, usually widows. In all cases, with the exception of repatriated beneficiaries (who under Sub-section 3 of Section 21 receive the balance of their award on arrival at their destination), where there appears to the Board no probability of the beneficiary using a lump sum, so that he, during his life, and his dependents (widow and children) thereafter, may become self-supporting, the annuity award has been granted.

THE VARIOUS FUNDS.

The amounts at the disposal of the various funds are given as follows:—Compensation Fund, £148,807: Insurance Fund, £79,532 (consisting of five monthly contributions by the employers and the employed of £39,766 each, being 2½ per cent. each on the distributed wages); and the Government Contribution Fund, £62,927. Out of the £100,000 allocated by Parliament, £75,000 was paid by the Treasury to January 21, 1913, and £12,072 was drawn therefrom. The actual expenditure of the Board in connection with its administration and work is met out of sums voted by Parliament, and for six months amounted to £4,916. With a view to the better working of the Act, the Board will submit at an early date suggestions relative thereto.

The best "Reef Traveller" is the *South African Mining Journal.*

FEBRUARY COSTS, GRADE, AND PROFITS.

Chamber of Mines' Analysis.

THE usual monthly analysis of the gold production for February issued by the Chamber of Mines is presented hereunder:—

THE WITWATERSRAND.

	Total value recovered	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West United ...	18,325	28	0	20	10	13,614	4,712	7	2
2. Bantjes Consolidated ...	38,145	30	2	24	2	30,612	7,085	5	7
3. Brakpan Mines	85,439	30	4	16	11	47,302	37,407	13	4
4. Cinderella Cons.	22,874	26	3	27	4	23,826	*725	*0	10
5. City Deep	79,581	37	6	24	5	51,079	26,692	12	9
6. City and Suburban ...	48,088	37	0	21	5	27,100	20,308	16	1
7. Cons. Langlaagte	55,263	27	5	19	5	37,740	17,521	9	0
8. Cons. Main Reef	31,964	29	7	19	6	21,140	10,486	9	8
9. Crown Mines	268 393	31	7	17	10	151,426	114,048	13	5
10. Durban Roodepoort ...	14,353	22	4	16	4	10,528	3,822	5	11
11. Durban Rood. Deep ...	36,390	30	6	24	9	29,532	6,445	5	5
12. East Rand Proprietary.	241,726	31	2	19	9	148,063	85,990	11	5
13. Ferreira Deep	104,078	41	3	20	2	50,661	51,748	20	7
14. Geduld Proprietary ...	17,849	32	5	25	5	13,988	3,818	6	11
15. Geldenhuis Deep	77,925	29	8	25	2	65,425	11,746	4	6
16. Ginsberg	20,457	30	4	20	9	14,001	6,454	9	7
17. Glencairn Main Reef ...	15,037	14	7	14	2	13,414	1,625	1	8
18. Jumpers-cum-Treasury .	12,968	41	11	38	9	10,509	2,004	7	5
19. Jupiter	36,832	18	1	17	2	34,984	3,130	1	6
20. Knight Central	26,540	22	5	19	9	22.567	3,592	3	2
21. Knights Deep	74,552	14	10	10	10	54,439	19,368	3	10
22. Langlaagte Estate ...	55,216	19	5	17	2	42,734	14,000	5	7
23. Luipaardsvlei Estate ...	17,403	22	3	19	5	15,061	2,157	2	9
24. Main Reef West	28,252	31	2	23	6	21,299	6,622	7	4
25. May Consolidated	14,769	21	4	15	7	10,724	4,009	5	10
26. Meyer and Charlton ...	34,096	52	3	19	0	12,388	20,043	30	9
27. Modderfontein B.	60,484	38	6	16	11	26,575	33,249	21	2
28. New Goch	27,270	21	11	16	6	20,585	6,646	5	4
29. New Heriot	19.684	36	2	21	8	11,464	8,006	15	1
30. New Kleinfontein	67,755	28	11	18	5	43,160	23,891	10	2
31. New Modderfontein ...	99,308	40	9	20	4	49,227	48,403	20	0
32. New Primrose	34,402	29	6	14	2	16,535	17,869	15	4
33. New Rietfontein	17,254	23	10	20	11	15,169	2,083	2	10
34. New Unified	15,525	26	7	19	5	11,076	4,448	7	10
35. Nourse Mines	78,785	31	10	22	2	55,159	23,747	9	7
36. Princess Estate	27,219	25	10	24	2	25,513	1,635	1	7
37. Randfontein Central ...	248,734	23	7	16	9	175,201	70,609	6	9
38. Robinson	102,519	39	0	14	6	37,664	63,005	24	2
39. Robinson Deep	69,153	26	0	16	8	44,227	27,940	10	6
40. Roodepoort United ...	20,134	16	3	19	9	24,486	*4,326	*3	6
41. Rose Deep	90,150	26	9	17	3	54,903	33,849	10	8
42. Simmer and Jack ...	73,358	20	7	11	1	39,422	34,490	9	8
43. Simmer Deep	51,279	17	1	14	4	43,181	6,354	2	1
44. Spes Bona Tribute ...	6,180	19	8	—		—	—	—	
45. Van Ryn	51,967	28	1	15	6	28,232	23,578	12	11
46. Village Deep	69,705	30	11	20	7	46,123	22,706	10	2
47. Village Main Reef ...	66,766	35	0	18	6	34,577	30,098	16	1
48. Vogelstruis Estate... ...	15,640	24	11	20	11	12,657	3,008	5	0
49. West Rand Central ...	3,475	34	5	33	2	2,912	499	5	8
50. West Rand Cons... ...	41,696	30	3	24	9	33,478	8,128	6	0
51. Witwatersrand	48,127	26	0	15	0	27,791	20,337	11	0
52. Wit. Deep	50,030	28	9	19	2	33,335	16,219	9	4
53. Wolhuter	33 825	27	3	19	6	24,232	9,199	7	5
Miscellaneous producers	15,642	—		—		—	—	—	
Witwatersrand totals	2,983,581	29	11	18	3	1911045	1019774	9	9
*Loss.				52 cos.		52 cos.	52 cos.	52 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
HEIDELBERG—									
1. Nigel	18,694	34	0	26	9	14,705	3.718	6	10
2. Sub Nigel	3,236	38	10	32	7	6,916	1,632	7	8
BARBERTON—									
3. Barrett	777	6	5	—		—	—	—	
4. Sheba	12.586	45	9	30	9	8,458	4,128	15	0
5. Sheba—Rosetta	930	—		—		—	—	—	
6. Worcester	4,536	16	1	12	11	3,653	863	3	1
LYDENBURG—									
7. Glynn's Lydenburg ...	6,079	41	0	22	5	3,333	2,615	17	7
8. Transvaal G.M. Estates	41,101	57	4	21	8	14,887	24,403	35	6
Miscellaneous producers	41,832	—		—		—	—	—	
Total (outside districts)	134,771	39	8	24	1	51,952	37,422	17	4
				6 cos.		6 cos.	6 cos.	6 cos.	
Grand totals	3118352	28	2	18	4	1962997	1057196	9	11
				58 cos.		58 cos.	58 cos.	58 cos.	

Legal Decisions Affecting Mining.

KRATZ v. WHITTY AND OTHERS.

In the course of a considered judgment in this matter, an appeal from a judgment of the Resident Magistrate, Johannesburg, Sir John Wessels said the defendants were the directors of the Rievallei G.M. Co., and towards the close of 1911 published a prospectus in which they undertook to proceed to allotment when 2,250 ordinary shares offered to the public for subscription had been subscribed, and the sum payable on application had been paid to and received by the company. Plaintiff alleged that defendants proceeded to allotment in February, 1912, when the minimum subscription named in the prospectus and required by section 3 of the Companies Act had not then been subscribed, and when the amount payable had not been received by the company. It also appeared that the conditions of allotment required by the prospectus were not complied with on the expiration of forty days after the first issue of the prospectus. The plaintiff contended that the allotment of 200 shares to him was an irregular one, and that by virtue of section 84 of the Act he was entitled to claim from the defendants the sum of £100 for loss and damage sustained by him by virtue of the irregular allotment. The Magistrate found that the defendants had not complied with the requirements of the statute as to allotment, but that the loss sustained by the plaintiff did not arise from the allotment, and therefore he granted absolution from the instance. From that judgment appeal was brought.

It appeared that Whitty paid by cheque for 1,605 shares, but received at the same time in exchange a cheque for an equal amount purporting to represent money due to him for the transportation of a certain ten-stamp battery, he agreeing to refund any difference between the £1,605 and the cost of transport should the cost be less. It was contended that under the circumstances the minimum shares required to be paid for were actually paid for at the time of the allotment, but it was clear from the evidence that the handing over of the cheque by Whitty was a mere blind, there being no intention on his part to pay for the shares or on the part of the secretary to accept payment. It was the directors' duty, before going to allotment, to return the money to the applicant. When they went to allotment they had done so before the requisite payments on the shares had been made, and more than forty days after the issue of the prospectus. Upon those facts must he determined whether the plaintiff was entitled to bring an action for damages, and that such an action would be against the directors who knowingly permitted or authorised an irregular allotment was clear from section 84 (2). If he had suffered loss he was entitled to recover from the directors personally. The only question left was whether he had proved he had suffered £100 worth of damage by virtue of the irregular allotment. There was an implied contract between applicant and directors that they would proceed to allotment only if the conditions required by the law had been fulfilled. They were not, and therefore he was entitled to have his £100 back and to be absolved from paying the other £100. The Act provided, under the circumstances, that the allotee had the right, within a month, to refuse to accept the shares, but the first general meeting took place a month after the date on which the law decreed that the allotee had no option but to take the shares. It was also provided that on irregular allotment all directors participating are liable to a fine and to pay to allotee damages or costs sustained. The shares of the company were evidently valueless. The £100 received from the plaintiff was lost to him, and he was entitled to demand it back and be absolved from further payment of £100. The appeal must therefore be upheld, and the judgment of the court below altered to an award of £100 damage against the defendants conjointly and severally with costs in both courts.

The concurring judgment of Mr. Justice Gregorowski was also read.

STRUCTURAL FEATURES OF THE WESTERN WITWATERSRAND.—III

The Extreme Western Rand—The Middelvlei Inlier Discussed—Witfontein and Bertha Estate Series.

Before proceeding to discuss the geology of that section of country which lies west and south-west of the line of the assumed West Rand fault, Dr. Mellor reviews the history of the faulting on the Witwatersrand. The simplest explanation of this is to be found if we imagine that in the early stages of folding a shallow synclinal fold or partial basin was created in the region beyond Roodepoort, a portion of which was let down to the north by the Witpoortje fault. Subsequent compression in an easterly and westerly direction led to the accentuation of these folds, particularly along their western portions, as evidenced by the high angles of dip and overtilting on that side of the curves. The elevation of the Black Reef series in those areas as compared with its level in adjacent areas to the north and south point to the accentuation of the compression and resultant folding in the West Rand district. The most conspicuous faults on the Central and Western Rand appear to fall into two contrasted groups which originated at widely separated periods of time and under very different conditions. In the earlier group are formed the Rietfontein, Witpoortje and Roodepoort faults. They appear to have arisen during a period of tension, and there is evidence to show that they occurred after the effusion of the amygdaloidal diabase. The distribution of the Black Reef quartzites, however, show that the Witpoortje and Rietfontein faults are of an earlier age than these. The minor and later group of faults, of which the Saxon fault is a prominent example, appear to have been formed under conditions of compression, associated everywhere with considerable folding and faulting, which has affected all the formations in the neighbourhood. "To this period of movement," Dr. Mellor observes, "must probably be assigned the accentuation of the folds on the West Rand above described, including that resulting in the severe fracturing of the Upper Witwatersrand beds to the south-west of Roodepoort and the formation of the dolomite basin on Vlakfontein. During this phase, also, it is most probable that considerable movements of compression took place along the old established lines of weakness represented by the Witpoortje, the Roodepoort, and especially the Rietfontein fault, and producing in the case of the latter some of those intricate features which it presents on the Central Rand, to which reference has been made in previous papers."

The Country West of Randfontein.

The area now to be described is separated from those already referred to by a north and south line running across the western portions of the farm Waterval and Randfontein, and across the middle of the farm Middelvlei. This line is occupied by a broad belt of Black Reef formation which greatly hinders the study of the geological relationship below. Dr. Mellor proceeds to describe this area as follows:

"The extreme Western Rand forms a comparatively simple block of country, in which practically the whole of the Lower Witwatersrand sequence from the base of the system up to the top of the Government Reef Series can be recognised. Owing mainly to the prevalence of low angles of dip, but also to the increase in thickness of a portion of the system already referred to, the width of the outcrop is very much greater than that of a corresponding section in other portions of the Rand, the increase being most noticeable from the base of the Hospital Hill Series up to the top of the Promise Beds, which together occupy a strip of country some three miles in width on the farms Witfontein and Hartebeestfontein, where the Promise Beds include broad belts of small-pebbled conglomerates, commonly known as the Witfontein and Bertha Estste Series of reefs. . . . The main difficulties arise in connection with the extreme south-western terminations of the Witwatersrand rocks, and in the satisfactory connection of the whole area with the country east of Randfontein. To deal first with the latter point, an inspection of the mapping will make it at once evident that a break of considerable importance must exist somewhere in the neighbourhood of the belt of the Black Reef Quartzites, which runs along the western boundary of Randfontein and extends north and south across Waterval and Middelvlei. The existence of such a break is made certain by the very evident duplication of the Government Reef Series, including the Government Reef itself on either side of the western boundary of Randfontein. Thus there is good evidence of practically a continuous run of the Government Reef in a north and south direction across the middle of Waterval and the northern half of Randfontein, the same horizon being repeated about a mile to the westward through a chain of inliers on the south-eastern portion of Elandsvlei, which, from the evidence afforded by one of the underlying bands of quartzites exposed along the north-eastern portion of the same farm, is most probably continued as far as the northern portion of the small inlier which runs northwards from the north-eastern corner of Elandsvlei on to the small farm Rietfontein. Similarly, further south, the Government Reef is found parallel to, and a little west of, the eastern boundary of Middelvlei, and also in a roughly parallel outcrop on the western portion of the same farm. It appears, then, that we must recognise the existence of a considerable fault or system of faults along the West Rand, separating the piece of country now under discussion from the blocks previously described. . . . . .
Were the conditions more favourable with regard to outcrops, a section taken from the middle of Vogelstruisfontein across the southern portion of Brandvlei to the middle of Droogeheuvel, would show the complete sequence of the Lower Witwatersrand System up to the top of the Government Series, with a consistent dip of about 25 degrees and free from duplications. Up to the horizon of the West Rand Slate and the Coronation Quartzite above it, a similar simplicity prevails throughout the greater portion of the block of country under discussion. On the southern portion of Haartebeestfontein and the western portion of Middelvlei the conditions are not so simple, and much steeper dips prevail. The outcrop of the West Rand Slate can be followed almost continuously from Elandvlei across Haartebeestfontein on to Rietfontein. On the south-eastern boundary of Haartebeestfontein, however, there is an outcrop of ferruginous banded slate, which can be followed for a considerable distance. This outcrop emerges just above the surface at intervals across the middle of an area covered with sandy drift, in which no other outcrops are seen, and in which no prospecting operations have been carried on. The banded slate is identical in character with the West Rand Slate seen in the same neighbourhood, with which it should, I think, be correlated, although the covering of all the associated horizons with drift prevents its identification with certainty. The Government Reef is well seen over a considerable distance along the strike about half a mile to the south-east, in a position which can only be accounted for by a duplication of a portion of the Government Reef Series, in which duplication it seems highly probable that the striped slate on the south-eastern boundary of Hartebeestfontein takes a part. If this interpretation is correct the duplicating fault must lie in the drift covered area west of the outcrop in question, as indicated on the map.* From its position and direction some connection of this fault with the continuation of the Witpoortje Fault might suggest itself. Such a connection, however, appears very unlikely on other grounds, and a more probable continuation of the Witpoortje Fault is suggested below, in connection with the Middelvlei inlier.

The Middelvlei Inlier.

The Middelvlei inlier, which Dr. Carrick accepted as the basis of his reasoning with regard to the supposed extension of the Main Reef series on the Western Rand Estates, is then dealt with:—

"Situated near the centre of the farm Middelvlei, and surrounded on all sides by Black Reef Quartzites and Dolomite, there is an inlier of Witwatersrand rocks, about half a square mile in area, which presents several interesting and peculiar features, the main points of

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* In his map of the Western Rand, Dr. Carrick takes a different view of the connections existing between many of these outcrops as well as their correlation with horizons on the Central Rand Section. For example, the banded ferruginous slate, usually known as the West Rand or Coronation Slate, is always referred to by Carrick as "Hospital Hill Shale," a correlation in which he is apparently supported by Dr. Hatch. The true Hospital Hill Shale which would be included in Carrick's "Great Basement Shale" is, however, separated on the West Rand by about 10,000 feet of beds from the West Rand or Coronation Slate, and their outcrops are distant some miles from each other. Carrick identifies the outcrop of Striped Slate along the south-west boundary of Hartebeestfontein as Hospital Hill Shale (using the term in his sense), and connects this with the outcrops in the inlier on the northern portion of Venterspost, and in that near the middle of the western boundary. The very extensive outcrop of precisely similar rock which can be traced almost continuously from beyond the north-western corner of Hartebeestfontein, south-westwards across that farm into Rietfontein, and of which the eastern outcrop appears to be a duplication, is thus relegated to a separate and lower horizon, while a further outcrop of exactly similar rock, similarly related to the Witfontein Series, which runs approximately parallel to the eastern boundary of Elandsfontein, is placed at a still lower horizon. It would be very difficult to justify this arrangement by comparison with sections much more likely to show the normal sequence, and in which no such repetition of banded ferruginous slate occurs.

> which are shown on the map. . . . . Numerous prospecting pits show that the quartzite series is overlain along the entire outcrop by a diabase, closely similar in character to the Amygdaloid which usually overlies the Witwatersrand System in this district, as, for example, on the Steyn Estate ground, on Doornkop and Vlakfontein. As is the case in both these localities, the junction of the diabase with the sedimentaries has everywhere the appearance of being conformable to the bedding of the latter. Close below the junction there occur numerous bands of conglomerate, alternating with bands of easily-weathered purplish or pinkish sandstones. The conglomerate bands and the associated sandstones are similar in character to those occurring to the east at the horizon of the Steyn Estate Reef, and the relationship to the overlying diabase is also closely similar. The more easily weathered beds, of which the conglomerates form a part, are also in this case, as on the Steyn Estate, underlain by much harder quartzitic beds, often very coarse and gritty in texture, which give rise to prominent surface outcrops. There is, therefore, a very close resemblance, both in character and relationship, between the quartzite and conglomerate series represented on Middelvlei, together with the overlying diabase, and the similar suite of rocks occurring at the top of the Witwatersrand succession in the country to the east. The relationship of the sedimentaries to the diabase, which is very clearly seen, seems in itself to afford good grounds for the correlation of these beds with those of the Steyn Estate on Doornkop, in which case they would occupy a position at the top of the Elsburg Series. Dr. Carrick correlates these conglomerates with the Main Reef Series, and is supported in that correlation by Dr. Hatch. It is, however, not easy to see in what respect these beds offer a resemblance to the Main Reef Series, except that mentioned by Carrick, that they appear to lie at about the right distance away from the outcrops of the Government Reef on the western portion of Middelvlei. This must, however, be regarded as a somewhat unreliable basis of correlation in such a highly disturbed area."

In endeavouring to explain the conditions represented by the Middelvlei inlier, the continuation of the Witpoortje fault beyond the southern extremity of Randfontein and its extension through the Middelvlei inlier with results similar to those which appear on the south-eastern portion of Rietvlei, may be suggested as not the least probable solution of the problem.

A Fault near Witfontein.

Passing further westwards, Dr. Mellor discusses the geology of Witfontein, Blaauwbank and Hartebeestefontein:

> "There would appear to be a break of considerable extent running in an approximately north and south direction a little west of the south-western corner of Witfontein, coursing from the southern portion of Doornfontein in to the northern portion of Blaauwbank. On the western side of this break, and along a line parallel to it, we have almost a continuous section from the Orange Grove Quartzites near their point of disappearance under the Dolomite on Doornfontein, through the Hospital Hill Series, which occupies the northern portion of Elandsfontein, to the Promise Beds and the West Rand or Coronation Slate, which form an inlier on the south-western portion of that farm. In this inlier the Promise Beds include excellent exposures of the Witfontein and Bertha Estate Series, and the West Rand Slate outcrops extensively in typical form. There can thus be little doubt about the identification of the whole of this section, nor about the existence of a considerable fault separating it from the main body of the formation to the north-east. On the eastern side of this break it is interesting to note the behaviour of the various members of the formation as they approach the neighbourhood of the fault, that of the Hospital Hill Quartzites being most readily followed, and probably offering the best indication of the probable course of the higher portions of the system. Thus the three strong bands of the Hospital Hill Quartzites which can be traced from the country north of Witfontein south-westwards across that farm, with a very constant dip of 25 to 30 degrees, show considerable disturbance as they approach the southern boundary. The dip gradually increases till the quartzites are vertical or overtilted and the strike changes to a south or south-easterly direction. This is especially well shown by the uppermost of the three bands, which, from the southern boundary of Witfontein, where already the dip has increased to 40 degrees, rapidly assumes a vertical position, and before being lost under the Black Reef Quartzites on Rietfontein is overtilted to such an extent as to dip 30 degrees west. A conspicuous outcrop of quartzite on the northern portion of Blaauwbank, which presents all the characters of the uppermost Hospital Hill Quartzites, is also overtilted to dip 60 degrees to the north-west, and is probably to be connected with the Witfontein outcrop. A second inlier on Blaauwbank, situated on its eastern boundary, has exposures of small pebbled conglomerates, most probably the "Witfontein Series," on its western portion, while on Ventersport the eastern part of the same inlier shows good exposures of the West Rand Slate, which might normally be expected to occupy such a position. The exposures of West Rand Slate in this inlier, however, show very broken conditions, pointing to considerable disturbance in the immediate neighbourhood. A small but clear and typical exposure of the West Rand Slate and the Quartzites next above and below occurs as an inlier on the northern portion of Venterspost. The possible connections existing between these various outcrops of the West Rand Slates are necessarily matters of conjecture owing to the intervening covering of a later formation and the obviously broken character of the country. The behaviour of the uppermost band of Hospital Hill Quartzites to the south of Witfontein, already described, makes it likely that the outcrops of similar quartzites on Blaauwbank, and of the Promise Beds (including the Witfontein Series) in the inlier to the south-east, are the continuations of the same succession of rocks on the south-eastern portion of Witfontein. The outcrops of West Rand Slate, which occur near the middle of the western boundary of Venterspost, would thus correspond with those which run towards that point from the south-eastern corner of Witfontein, while the West Rand Slate of the inlier on the northern portion of Venterspost would be the continuation of that which crops out in the drift-covered area and runs southward from the middle of the southern boundary of Hartebeestfontein, and which is regarded as a duplication. Dr. Carrick takes a different view of these possible connections. To continue, however, as he does, the Witfontein Series from Witfontein south-westwards across the north-western corner of Rietfontein is certainly not admissible, in view of the course taken by the uppermost band of the Hospital Hill Quartzites on Rietfontein described above, which can be traced with certainty right across the supposed extension of the Witfontein Series. Moreover, the extensive outcrop of striped ferruginous slate near the eastern boundary of Elandsfontein, with which Dr. Carrick connects a slate which lies below the Witfontein Series on Witfontein, not only presents all the characters of the West Rand Slate, but lies above a big succession of coarse quartzites and small pebbled conglomerates corresponding closely with the Bertha Estate and Witfontein Series. These, again, occupy a normal position with regard to the remainder of the Lower Witwatersrand section exposed on the northern part of Elandsfontein and the southern portion of Doornfontein. The apparent simplicity of structure in this neighbourhood indicated on Dr. Carrick's map requires, therefore, some modification if all the observable conditions are taken into consideration."

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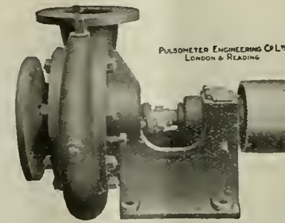

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The ratepayers of Umtata have approved of a scheme for the supply of electric power for the town. This is estimated to cost £7,000, and the Municipal Council has been authorised to see the scheme carried out. The Council will borrow the necessary funds from money in hand for the water scheme. Power will be generated at the Umtata Falls—one mile from the town.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Gold and Tin.

To the Editor, *South African Mining Journal.*

Sir,—Would you kindly oblige me with information as to what is happening with regard to (1) New Rand, Ltd., and (2) Anglo-German Tins? Thanking you in anticipation.—Yours, etc.,

GOLD AND TIN.

Bloemfontein,
March 31st, 1913.

[Reports will be issued by both companies shortly, and the annual meeting of No. 2 will be held on the 21st inst.—Ed., *S.A.M.J.*]

A Critic on Crown Mines Amalgamation.

To the Editor, *South African Mining Journal*

Sir,—I beg space to enter a caveat against Mr. Warriner's Crown Mines amalgamation apologia—*vide* the extracts from his paper as published in your columns in your issue of March 15. To clear the ground I had perhaps better frankly confess that I know nothing of mining outside South Africa, except from what I have read in the mining journals of the world; that I am only a practical miner, without even a School of Mines training; that all I know about mining has been acquired on the Witwatersrand since the war; and that, consequently, I cannot claim to be an expert. I am not going exhaustively into the sub-heads of Mr. Warriner's apologia, where he enters into comparative detail to point out causes for present-day increased costs at the Crown Mines. It will suffice to my purpose if I briefly point out that several of the Barnato and Gold Fields groups of mines have reduced their costs since the introduction of the Eight Hours' Act. I therefore disallow his claim of 6d. of the increased costs as being due to that cause. Exactly the same argument I apply to his claim that the increased cost of labour has appreciably increased his costs. The much-talked-of increased cost of native labour is more apparent than real! But it is a subject requiring separate treatment. The fact, however, that Barnato and Gold Fields' costs are lower in spite of the increased cost of native labour is offered as evidence against his assumption. As regards an increase of about 3 per cent. in sorting, it is hardly reasonable to raise that question when it is noted that Crown Mines grade to-day is about 3s. a ton higher than before amalgamation! That is to say, the month of June, 1906, which month Mr. Warriner has seized upon for his comparative data! Mr. Warriner says: "It is not unreasonable to conclude that a study of the position in a year's time will show savings far in advance of those I have been able to point out in this paper." I am only concerned with the future and because I am afraid there is nothing to justify the optimism preached by Mr. F. Eckstein, at the last annual general meeting of the Central Mining and Finance Corporation in London, and that of Mr. Warriner in Johannesburg, I am venturing into the blazing publicity of your columns with my possibly indiscreet *caveat*! It is put forward as an established fact that since amalgamation surface costs have been reduced by 1s. 7·99d. per ton, and that underground costs have gone up to about the same extent. But no mention is made of the fact that about a million pounds has been spent in improving underground working conditions in order to reduce costs. Not only to reduce the actual cost in money but to bring about a lessened demand for native labour underground, *vide* Mr. F. Eckstein at the annual meeting above referred to. But unfortunately for Mr. Warriner's premises his figure of enlarged underground costs when compared with pre-amalgamation costs, large as it is, is not large enough. In selecting June, 1909, to make his January, 1913, comparisons with, Mr. Warriner has been singularly unfortunate. June, 1909, was the last month in which the several individual mines appeared in the monthly report of the Chamber of Mines. Mr. Warriner surely knows there were certain disturbing factors that month caused by the impending amalgamation which make the returns for that month unreliable for comparative purposes. That month's returns possess very little value for comparative purposes with January, 1913. Why was not May, 1909, taken for comparison? The general average of Crown Reef costs up to May were about 14s. 7d., whereas in June, owing to amalgamation pre-effects, the costs were 17s. 5d.—an increase of 2s. 10d. a ton. Langlaagte Deep costs in May were 15s. 8d., but in June were 16s. 5d., or 9d. up. In June, 1909, however, Robinson Central Deep costs were 8d. lower than in May. As a matter of fact, June, 1909, was a very bad month for three of the four mines concerned in the amalgamation and had not the Robinson Central Deep had an extraordinarily good month, *i.e.*, 33,430 tons as against 31,270 in the longer month of May, the combined record of the four mines would have been still more unreliable, apart from any question of a shorter month. I think I have said enough to raise doubts as to the reasonableness of the apologia. February returns should raise more doubts. The Crown Mines in February were down 20,000 tons, and the costs up a further 10d. since January, when Mr. Warriner compiled his analysis. I shall regret as much as anybody if my postulate is to have a disturbing effect, but I must emphatically protest against the current practice of refusing to recognise facts until after the "output" is declared. My communication is getting unwieldy and I will conclude by reminding the industry that there is always a traceable cause to every realised effect; and that, given a correct diagnosis of an evil, the wit of man always has found a remedy.—Yours, etc.,

UNDERGROUNDER.

Johannesburg,
18th March, 1913.

P.S.—By inadvertence this letter was too late for last issue, and I understand Mr. Warriner has gone on leave. But the question is not a personal one at all, therefore I let the letter take its course.—U.

More Criticism from Underground.

To the Editor, *South African Mining Journal.*

Sir,—Costs at present are higher than they should be, is the tone of nearly every speech delivered nowadays by persons who should know. But I have not yet seen or heard of anyone giving a reason, except that of Mr. Hildick Smith written to you some time ago. He blames "hustle" for a greater part of the inefficiency now occurring than really ought to be the case. On the majority of mines now it is a question of economy gone mad. More especially is this the case with steel. In order to reduce costs of sharpening and hardening new and used steel, machines are being starved; where machines ought to have 24 to 35 jumpers per machine per shift minimum, a machine man gets from 20 to 40 to run three or four machines, in fact I have known cases where a developer was given regularly 15 jumpers to drill a round of 14 holes, and this in ground that was known to be "hard." Again, the practice of patching hose pipes leads to more loss of time and air leakage than would pay for new pipes over and over again. Putting a clamp on a leaking main is absolutely futile: it never stops the leak. Take the pipe out, put in a new pipe and cut your old one into two lengths. It is right here where waste does occur. Each pipe-fitter should have his shop underground with a bench and storeroom for pipes, with the necessary means for re-threading, cutting and straightening, the useless pipes being handed over to the waste-packer for use as “ lagging ” old tracks, and ladders can also be used for the same purpose. Timber is sent down to stopes and not all of it is used; it gets covered up or becomes knocked about and is looked upon as worthless. Teach your timberman “ cleanliness,” that is, not to leave unused timber where he has been working, send it to the station; whether he has been putting in a box or stope timbering, it must not be left unused or unget-at-able, and when working in inclined shafts it must not be piled on to your pipe lines and cables, with the old sills he has taken out. It is better to pay your skipman for another hour or two and have them sent to where they will be of use than to pay for damaged mains or to spend weeks clearing your shaft when you have to put in a new line. It is a practice with shaft timbermen to put in a requisition every Saturday for stores. Were none left over from last week? Now, do not keep him short, but ensure everything he gets is used. The track layer is usually the worst offender; he drops enough dog spikes, fish-plates and clutch bolts from his sack to keep a normal mine supplied. Old tracks are unwieldy and not easy to cut—being steel—not being wood. They can be used for grizzleys when cut, or for lagging. Your tracklayer in the drives finds it much easier to order new “ points ” than take up old ones and relay them; his bill for spares is, as a rule, too heavy, as it is seldom he has any place to store his spares, at once convenient and accessible. Explosive boxes must be repaired by a carpenter periodically: the bottoms rot, every or nearly every new miner puts on a new hasp and staple, and in time the box is useless; it is better to repair the old one than to be continually ordering new ones, so that your lashing boys may have timber to carry away for firewood. On some mines it is the practice for shift bosses to examine the miners' boxes monthly and prevent him keeping old fuse detonators and gelatine therein; this is an absolute necessity to prevent accidents. Now we come to the crux of the whole case: when stores are ordered or asked for, there is usually a need for them; men will not ask continually for anything, no matter how urgently it is needed. Your efficiency in some degree is being retarded by a shortage of supplies, and it must be remembered that in mining, as in most commercial undertakings, that every unit hinges on and is interwoven with every other unit, and each must be got to work at its highest efficiency. Teach your men to finish their job before leaving it and not start a dozen and leave them all half done; give them some idea of method; see that their tools are good and their supplies are sufficient. Another rotten practice is making your trammer have a few boys in every stope or working place on his level or levels; put a decent sized gang into each stope or none. It is absolutely useless putting two boys into each stope to scrape round the box. That is not economy. Clean one stope rather than play about in six; if there are not sufficient lashing boys to enable your gangs to get at the face to drill without being delayed by broken rock, take a hammer gang for a shift and put them in. What is your relation between coco-pans and lashing boys? I know they are a nuisance to take down, as a rule, but if there are not enough to keep your boxes clean and your boys working you are losing time, and time is what you are fighting. Get the greatest amount of rock hoisted in the shortest possible time, and every item that will enable you to do so makes for more efficient working—if you do not break you cannot hoist. If economy is your aim, close the mine and you will only have to pay for pumping and interest on capital. If it is efficiency with economy, see that every one has the wherewithal to work and does it. Go straight for the efficient work and profits cannot help going up. I did not want to touch on the labour question in this, but it would scarcely be complete without doing it. When complaints are made give them your fullest attention and impartial enquiry: there is usually a cause. Before discharging a man be sure to an absolute certainty that he is unfitted—more often you will find it pays you and the company you are working to give that man a change of occupation much better than to discharge him. There are a large body of men in different positions who lose sight altogether of the fact that they are working for a company and not to merely satisfy their own whims and fancies.—Yours, etc.,

E. H.

The White Labour Supply.

To the Editor, *South African Mining Journal.*

Sir,—Your correspondent Mr. Roach, in your issue of the 15th ult., writes a letter in which he prognosticated a most crucial period for the Rand mining industry as regards the supply of white labour, inasmuch as, according to Mr. Roach, hundreds of the most capable miners will leave the Rand, never to return. One heard the mining magnates declare that if the Chinese were repatriated the mines would have to close down, and yet we find the industry at the moment in a very healthy state as to dividends. Mr. Roach made very marked allusion to Cornishmen as being particularly bright stars engaged in the industry, and as to their very desirable citizenship owing to their charming dispositions, etc. All this may no doubt be very true; at the same time, one cannot forget the fact that when the war broke out, their spirit of citizenship appeared to fully carry out the old saying that “ discretion was the better part of valour,” as these very loyal citizens returned to Cornwall, leaving their comrades to protect the mining industry. Mr. Roach informs us that mining is an art, and that to become a proficient miner entails a *lifetime of close application*, etc., etc. He then informs us of a generous estimate of ten years' underground work, and the worker, when he should be in the bloom of manhood, dies by inches. Where, then, do we find this practical model of the mining craft as held forth by Mr. Roach in the Cornishman or any other man? As apparently they must die before they can possibly attain Mr. Roach's perfect state as practical miners, to this, I presume, we must attribute the quandary that the authorities now find themselves in—to define what is a miner. Perhaps Mr. Roach will come to their assistance and produce a case. I can afford to make Mr. Roach a present of “ the correct alignments ” and the technical knowledge, etc., referred to as being the sole property of managers, shiftbosses, and mine captains. I have seen too much “ make believe ” underground, which causes one to become more than sceptical as to the infallibility of these highly-paid underground officials. Turning to the question of the thousands of deaths occurring to the white men underground, no doubt it is all very shocking and appalling, but we all know what we have to undergo when we go underground; we do it all with our eyes open, and for the sole object of the “ greed of gain.” How many of us have worked eighteen hours at a stretch to get our round down? And this under conditions quite knowledgeable to us—that we were committing suicide, no water being then used to lay the dust. Do we not blast and rush in where angels would fear to tread? And then we hear Mr. Roach holding forth that it is no chimæra of the imagination that thousands of applications are being received for compensation under the new Act! It is quite possible that had the Act been in force ten years ago, the applications would have been tens of thousands. One must naturally feel shocked, but the fact remains, we have ourselves to blame; we have accentuated the horrors for the greed of gain, viz., the “ big cheque.” The mining authorities did not trouble their heads as to what conditions the men worked under, and the men went below to earn a big cheque and then to die! However, though late in the day, the law has stepped in, and legislation is provided to protect the miner against himself and against those who closed their eyes to the death-rate.

With the changed conditions of mining underground, we may come back to the question of the employment of white labour all round as a much looked-for condition of things, and, as stated by me, there are to be obtained a sufficiency and a surplus of British workmen to undertake the work of mining on the Rand, and to do that work cheaper, and at a far less loss of life, than is done to-day by Kaffirs, from the latter of whom the white man underground contracts tuberculosis, inasmuch as he is day by day breathing the disease-laden air produced by the thousands of natives underground in drives, winzes and stopes. The miner comes to the surface, he betakes himself to a hovel in the shape of a bedroom, the windows closed all day, the rooms “ back to back.” Where does the carrying out of the law come in? Natives care nothing as to the carrying out of regulations; they dislike the use of the spray, they prefer the heat and the dust. How many natives are there to-day dying from phthisis and tuberculosis, and who are working side by side with white men underground, and who come up to the surface packed into the cage or skip with white men? And this by the orders of a mine captain, and then Mr. Roach informs us that if all white labour be used the evil would be increased, as the amount of extra exertion necessitates a larger quantity of air, and the more air the more dust! He does not mention the use of water as a perfunctory adjunct for allaying dust! He makes no allowance for the riddance of the foul Kaffir. The intelligence of the white man, who has had to do the work of a Kaffir at home for 30s. to £2 10s. per week, is backed by the laws of this country, as protecting him during his work underground, and the incentive to him to earn a wage which may reach £20, £30, £40, or £50 per month or less. All these factors open a field for an all-white labour policy for the industry, seeing that a white man is worth three natives, and the time is arriving for its inception. The mining houses will come to it; personally, it matters not if the white men are made up of Britishers and foreigners—are not the latter amongst us to-day?

As to the cost of living, as stated by me, outside the question of rent, the difference between the cost of living at Home and here is at once made more than good by the extra wages. Mr. Roach appears to accept the figures as given by me re the cost of food being a revelation to the young men on the mines, the fact being that the young men who use the mine boarding house and live on the property come out at figures quoted by me, as on some mines they pay but £5 per month for board, and where a "mess" is in vogue it works out less than this, the average price at most mine boarding houses being £5 10s. per month, or 1s. 4d. per meal, added to which the *young men* on the mines pay but 10s. per month for their lodging; thus where does Mr. Roach's revelation to most young men on the mines come in? Most assuredly they do fare sumptuously when compared with the menu laid before them in their homes in the Old Country. As to my knowledge of mining, etc., it is quite possible that I have forgotten more about mining than Mr. Roach ever knew, or is likely to know; and as to my idea of living being frugal in the extreme, I am dealing with facts as they stand before us, and the wage-earners must cut their cloth according to their measure. That measure can be made liberal enough and economically profitable to the mine owners by employing all white labour on the Rand mines, and this without the inflation of the wage bill.—I am, etc.,

AN UNDERGROUND WORKER.

March 31, 1913.

A Correction.

To the Editor, *South African Mining Journal.*

Sir,—My attention has been drawn to the paragraph in your issue of the 8th ultimo dealing with some figures of the "National Mutual Life Association," a Colonial office, and I should like to point out that the words "of Australasia," forming part of the Association's name, have been omitted. As the paragraph stands the reference is misleading and might be taken to concern this old English office, which has no branch in South Africa.—Yours, etc.,

GEOFFREY MARKS,
Actuary and Manager.

The National Mutual Life Assurance Office,
39, King Street, Cheapside, London, E.C.,
March 7th, 1913.

Natal Coal and Labour Returns.

The following coal and labour return for Natal Province for February is compiled and furnished by the Government Mining Engineer's Department:—

Colliery.	Average Labour in Service. Whites.	Asiatics.	Natives and Coloured	Total.	Output, Tons of 2000 lbs.
Natal Navigation	81	549	712	1,342	27,630
Durban Navigation	48	167	870	1,085	24,748
Burnside	56	720	297	1,073	21,619
Hlobane	39	64	783	886	19,366
Elandslaagte	40	861	195	1,096	17,476
Utrecht	33	49	854	936	15,839
Glencoe (Natal)	35	216	674	925	14,995
St. George's	34	272	555	861	13,722
Natal Cambrian	27	245	385	657	12,674
Hatting Spruit	17	112	320	449	10,282
South African	31	281	302	554	9,862
Ballengeich	24	228	302	554	8,647
Natal Steam	10	32	255	297	6,022
Newcastle	14	53	272	339	4,931
Ramsay	10	146	150	306	5,699
Dewar's Anthracite	3	5	59	67	544
Star	1	11	19	31	444
South African (Vryheid) Coke	4	—	58	62	315
Avon Collieries	2	—	7	9	230
Fairleigh	8	51	50	109	84
Wallsend (Natal)*	12	20	47	79	—
Vaalbank*	1	—	2	3	—
Veelsgeluk*	2	—	10	12	—
Totals	532	4,082	7,369	11,938	215,138

* January labour repeated. Returns not received in time.

COAL BUNKERED AND EXPORTED AT DURBAN.

	Tons.
Bunker coal	87,680
Coal exported—overseas	13,655
Coal exported—to Union ports	38,997
Total	140,330

S.W. Transvaal Diamond Diggings.

The returns from thiry different alluvial areas in the South-Western Transvaal for the month of February show a total of 7,695⅜ carats value £43,063 6s., as against 7,105 carats value £40,381 1s. in January. The month's total is the highest on record and in this result Dievedraai and Eastleigh are the main factors. A summary of the returns, which are of diamonds actually sold, is as follows:—

	Carats.	*Value.*
Bloemhof	1,838½	£10,128 16 0
Dievedraai	1,173	6,637 7 6
Eastleigh	839	6,026 15 0
London	790	4,422 9 6
Koppiesvlei	619¾	3,385 15 0
Rietput	567	3,189 0 0
Avondster	346	1,491 2 6
Panfontein	305¼	1,351 5 0
Mooifontein	220¾	954 17 6
Grootdoorns	119	841 0 0
Zwartlaagte	135¾	706 10 0
Christiana	102¼	673 12 6
Kuilfontein	144½	613 17 6
Sch.-Reneke	81½	551 17 6
Blesbokfontein ...	78¼	420 0 0
Maroetjesfontein ...	65¼	389 10 0
Modderkraal	63½	344 15 0
Weltevreden	71¼	326 17 0
Goedgenoeg	59	271 5 0
Olievenfontein ...	27½	138 0 0
Other sources	47½	225 13 6
	7,695⅜	£43,063 6 0

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RAND MINES' SUBSIDIARIES: A QUARTER'S OPERATIONS.

The following is a tabulated summary of the working operations of certain of the companies in which the Rand Mines, Ltd., holds shares for the financial quarters ending 31st October and 31st December, 1912.

	Rose Deep, Limited.	Geldenhuis Deep, Limited.	Ferreira Deep, Ltd.	Crown Mines, Limited.	Durban Roodepoort Deep, Ltd.	New Modderfontein G.M Co., Ltd.	City Deep, Limited.	Village Deep, Limited.	Bantjes Cons. Mines, Ltd.	Modderfontein B. Gold Mines Ltd.	East Rand Proprietary Mines, Ltd.	Main Reef West, Limited.	The Village Main Reef G.M. Co., Ltd.	The Jupiter G.M. Co., Ltd.	Nourse Mines, Ltd.	The Wolhuter Gold Mines, Limited.
Financial Quarter Ending	December 31, 1912.														Oct. 31, 1912.	
Mine																
Development Work—																
No. of feet driven, sunk and risen, exclusive of Stopes	3,687	6,110	2,492	9,705	3,361	3,267	2,495	3,413	4,461	3,141	15,236	2,610	122	2,516	7,532	2,162
Main Reef—																
Distance exposed (feet)	1,167	773	42	244	1,320	1,843	610	—	—	2,143		—	—	—	975	—
Width (inches)	27	21	28	34	31	14	29	—	—	16		—	—	—	42	—
Assay Value	29s 10d.	55s. 10d.	12s. 7d. (Leader)	14s. 3d.	41s. 6d.	129s. 4d.	19s. 9d.	—	—	80s. 7d.		—	—	—	31s. 11d.	—
Main Reef Leader—																
Distance exposed (feet)	1,432	2,478	896	3,051	—	—	1,295	2,040	560	—		—	—	—	2,145	—
Width (inches)	16	8	37	27	—	—	16	39·5	28	—	21	—	—	—	14	—
Assay Value	39s. 1d.	84s. 10d.	54s. 2d.	66s. 9d.	—	—	154s. 6d.	54s. 2d.	32s. 8d.	—	10·5 dwt	—	—	—	92s. 1d.	—
South Reef—																
Distance exposed (feet)	1,417	3,298	771	2,135	975	—	—	342	2,060	—		—	73	—	1,930	—
Width (inches)	20	19	18	34	10	—	—	34·0	12	—		—	37	—	17	—
Assay Value	28s 3d.	55s. 0d.	92s. 3d.	51s. 3d.	137s. 1d.	—	—	48s. 2d.	89s. 11d.	—		—	39s. 11d.	—	99s. 1d.	—
Reduction Works																
Ore received from Mine (tons)	244,326	177,100	191,305	573,354	91,438	153,080	143,699	174,778	85,805	113,017	502,371	60,233	151,452	—	199,645	96,365
Waste sorted out (per cent.)	16·3	18·8	14·8	11·3	18·2	4·9	13·6	15·4	10·1	11·2	9·6	—	17·8	—	16·0	12·1
Tonnage crushed	204,000	143,900	162,800	506,800	75,090	145,900	123,800	149,900	77,100	100,100	453,200	52,396	125,000	124,650	167,500	84,000
Number of stamps operating	300	300	240	660	100	180	150	180	90	80	820	90	220	105	260	120
Number of tube mills operating	7	7	7	25	3	7	8	7	3	5	—	3	5	—	7	4
Value of Ore before crushing—																
Mill yield per ton	17s. 2d.	21s. 6d.	28s. 10d.	21s. 10d.	21s. 11d.	28s. 5d.	23s. 1d.	20s. 5d.	16s. 7d.	19s. 2d.	—	—	28s. 3d.	—	21s. 1d.	—
Assay value of pulp	10s. 9d.	11s. 5d.	13s. 10d.	10s. 10d	9s. 11d.	10s. 7d.	14s. 0d.	9s. 9d.	13s. 3d.	17s. 2d.	—	—	14s. 2d	—	8s. 9d.	—
Total	27s. 11d.	32s. 11d.	42s. 8d.	32s. 8d.	31s. 10d.	39s. 0d.	37s. 1d.	30s. 2d.	29s. 10d.	36s. 4d.	—	—	42s. 5d.	—	29s. 10d.	—
Total yield (fine ozs.)	65,092	51,102	79,753	188,419	27,275	65,907	51,808	52,223	26,033	41,066	170,371	18,736	60,808	30,722	58,175	28,456
Yield per ton	26s. 10d.	31s. 7d.	41s. 2d.	31s. 3d.	30s. 6d.	37s. 11d.	37s. 2d.	29s 3d.	28s. 4d.	34s. 6d.	32s. 5d.	29s. 11d.	40s. 10d.	20s. 8d.	29s. 2d.	28s. 1d.
Accumulated slimes treated (tons)	—	6,560	3,050	—	—	8,700	7,200	—	—	—	—	—	7,710	—	3,851	—
Accumulated slimes yield (fine ozs.)	—	710	573	—	—	579	778	—	—	—	—	—	639	—	546	—
Working Expenses																
Cost	£167,511	£196,235	£168,372	£153,865	£92,838	£138,300	£149,457	£152,401	£90,175	£82,146	£176,283	£59,254	£111,380	£107,575	£169,110	£75,386
Cost per Ton Milled	16s. 5d.	£1 7 3	£1 0 8	£0 17 11	£1 4 9	£0 19 0	£1 4 2	£1 0 4	£1 3 5	£0 16 5	£1 0 3	£1 2 7	£0 18 3	£0 17 3	£1 0 2	£0 17 11
Revenue																
Value of Gold produced	£273,707	£227,372	£335,525	£792,056	£114,292	£277,032	£230,346	£219 330	£109,031	£172,642	£734,189	£78,542	£255,287	£128,963	£243,783	£119,254
Value per Ton Milled	£1 6 10	£1 11 7	£2 1 2	£1 11 3	£1 10 5	£1 18 0	£1 17 3	£1 9 3	£1 8 3	£1 14 6	£1 12 5	£1 9 11	£2 0 10	£1 0 8	£1 9 1	£1 8 4
Working Profit																
Amount	£106,193	£31,137	£167,153	£338,191	£21,454	£138,732	£80,889	£66,929	£18,855	£90,496	£276,916	£19,288	£140,907	£21,388	£74,673	£43,868
Per Ton Milled	£0 10 5	£0 4 4	£1 0 6	£0 13 4	£0 5 8	£0 19 0	£0 13 1	£0 8 11	£0 4 10	£0 18 1	£0 12 2	£0 7 4	£1 2 7	£0 3 5	£0 8 11	£0 10 5
Other Sources																
Net Revenue or Expenditure—																
Debit	£3,400	• £2,046	• £670	£17,373	£2,027	—	—	£2,039	£894	—	—	—	—	—	—	—
Credit	—	—	—	—	—	• £1,468	• £1,276	—	—	£2,058	—	—	•£11,813	£1,440	• £909	—
Net Profit	£102,793	£29,091	£166,483	£320,818	£19,427	£140,200	£82,165	£64,890	£17,961	£92,554	—	—	£152,720	£22,828	£75,582	—
Capital Expenditure	£983	† £1,295	£1,214	†£18,450	£8,994	† £20,717	† £5,069	† £5,170	§£26,727	§£21,485	£54,686	£11,234	—	£774	£656	£3,169
Cash Position																
Financial Position, Cr. Balance	£53,595	£73,282	£271,014	£240,934	—	£110,229	£110,106	£62,215	£60,233	£138,267	£198,410	—	£259,216	—	£96,386	—
Less Cash Assets (Stores, Livestock, etc.)	£39,624	£51,252	£42,025	£145,863	—	£79,151	£43,660	£31,444	£53,264	£76,732	£134,092	—	£24,328	—	£40,414	—
Balance Net Cash after allowing for Liabilities	£13,971	£20,030	£231,989	—	—	‡ £31,078	£66,446	£30,771	£6,969	£61,535	£64,318	—	£234,888	—	£55,572	—
Financial Position, Dr. Balance	—	—	—	—	£4,229	—	—	—	—	—	—	—	—	—	—	—
Add Cash Assets (Stores, Livestock, etc.)	—	—	—	—	£19,235	—	—	—	—	—	—	—	—	—	—	—
Balance Net Cash Liability	—	—	—	£201,929	£23,461	—	—	—	—	—	—	—	—	—	—	—
Interim Dividends Declared—																
Payable to Shareholders registered on books as at	Dec. 31, '12	Dec. 31, '12	—	Dec. 31, '12	Dec. 31, '12	Dec. 31, '12	Dec. 31, '12	Dec. 31, '12	Dec. 31, '12	Dec. 31, '12	Dec. 31, '12	Dec. 31, '12	Dec. 31, '12	Dec. 31, '12	—	Oct. 31, '12
Rate per cent.	22½%	5 %	—	55 %	5 %	15 %	12½ %	10 %	6½ %	20 %	12½ %	5 %	35 %	2½ %	—	8¾ %
Total amount of distribution	£157,500	£29,288	—	£517,058	£22,000	£210,000	£156,250	£106,067	£31,394	£140,000	£305,737	£24,559	£165,202	£25,355	—	£75,250

* Including Accumulations. † Exclusive of the proportion of an annuity payable to the Government in respect of mining rights acquired under certain claims. ‡ Exclusive of the balance of Working Capital on hand amounting to £162,263. § Credit.

Rhodesian Section.

LATEST MINING NEWS.

The February Output—Shagari Mines—Hartley District Returns—The Shamva Railway—Bucks Reef Report.

The total value of Southern Rhodesia's mineral output for the month of February has been officially declared at £232,971, as compared with £236,471 for January. The figures for the two months read as under:—

	January.		February.
Gold	£220,776	......	£208,744
Silver	1,401	......	1,233
Lead	468	......	404
Chrome iron	8,017	......	16,292
Coal (sales)	5,809	......	5,915
Diamonds	—	......	353
Totals	£236,471	......	£232,971

As will be seen from the foregoing table, the silver and lead returns, which are really a by-product of the gold industry, showed decreases corresponding to the shorter month's run. The coal sales marked a fractional increase. Chrome iron shipped was on a substantially larger scale. The table shows, too, after a very long absence, a small but nevertheless welcome output of diamonds. The month's gold output, at 49,595 ozs., valued at £208,744, contrasts with January's 52,455 ozs., worth £220,776. It must be remembered these comparisons are between a short month and a long month. The reports from the various districts as to labour and water supplies are now fairly satisfactory. A table, showing the value of the monthly and annual gold outputs since January, 1911, together with the value of the other minerals recovered, is appended:—

Month.	1911.	1912.	1913.
January	£207,901	£211,918	£220,776
February	203,055	209,743	208,744
March	231,947	215,102	—
April	221,296	221,476	—
May	211,413	231,407	—
June	215,346	226,867	—
July	237,517	240,514	—
August	243,712	239,077	—
September	225,777	230,573	—
October	218,862	230,072	—
November	214,040	225,957	—
December	217,026	218,661	—
Total gold	£2,647,895	£2,707,367	£429,520
Other minerals ...	212,864	257,230	39,922
Total value	£2,890,759	£2,964,597	£469,442

* * * *

According to the Salisbury correspondent of the *Rhodesian Mining Review*, "for some weeks past it has been rumoured that the Amalgamated Properties, Ltd., and the Gold Fields were negotiationg for an option to acquire the properties of the Shagari Mines, Ltd. Mr. Dyer the expert of the first-named company, was here for some days, and, if rumour is to be believed, the competition between the two houses has been marked by a keenness which has not been visible for some time. From the point of view of the prospector and the 'small owner,' this competition is, of course, pre-eminently satisfactory. It has tended, moreover, to inspire the mining community with a feeling of optimism, which has for a long time been on the wane, and it has proved that, even in these days of depression, 'good mines need no bush.' The negotiations, it is understood, were somewhat prolonged; but they have resulted, it is said, in a deal between the Gold Fields and the Shagari Mines, Ltd., whereby a working option for twelve months has been granted over the whole of Shagari properties, which, as most people know, include the Dalny, the Dalny West, and the Whistlecock. That they are very valuable mines goes without saying, but recent development work, it is said, has proved them to be much larger properties than was originally supposed, and too extensive for the owners, with their limited capital, to effectively develop. Hence the arrangement which has been made. What the purchase is to be has not been disclosed, though it is an open secret that, in the event of the option being exercised, the shareholders may reasonably expect a return of at least 100 per cent. on their investment."

* * * *

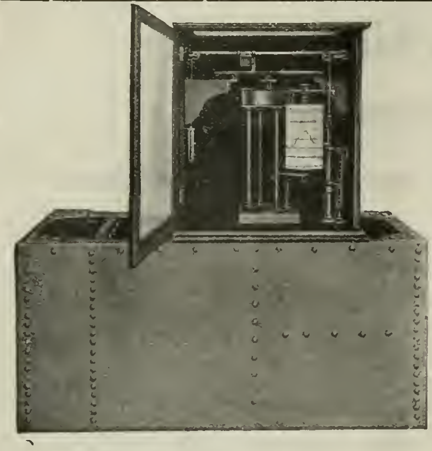
In the February output sheet the Hartley district figures were 11,390 ozs., as compared with January's 12,123. The chief producer in this district of Mashonaland is still the Giant, which sent in 3,061 ozs. from its 10,089 tons treated, but it is regrettable that there is no news yet as to the long-lost reef. Other good returns from this district, which had the same number of contributors as in the previous month, came from the Acorn, Battlefields, Brilliant, Eiffel Blue, Kanyemba, Owl, Pickstone (575 ozs. from 576 tons), Shephers (492 ozs. from 150 tons), Sid and Washington. The result from the newly-started-up Thistle-Etna was 1,065 ozs. from 2,507 tons milled.

* * * *

The railway to the Shamva has been completed at last, and the first train to run through from Salisbury has reached Shamva terminus. Its passengers comprised Mr. Maguire, Mr. Newton (the Treasurer), Mr. Townsend (representing the Railways), Mr. Buncombe (representing Messrs. Pauling & Co.), and Mr. H. A. Piper, who arrived from Que Que.

* * * *

The directors of the Bucks Reef Gold Mines, Ltd., in their annual report, state that since the last general meeting four further blocks of ten claims have been acquired, and the property holdings now consist of 320 claims, together with a machinery site of three acres. The results during the first seven months showed small profits; but in each of the last five months a loss was made, owing to the lower grade of ore crushed. The result of the crushing operations during the year was a profit of £436, to which should be added £1,077, the net proceeds of the sale of the concentrates that had accumulated since the inception of the company; whilst the sum of £2,932 18s. 6d. was expended on capital account, the greater portion representing prospecting work on the new blocks of claims acquired. In view of the steady loss on crushing operations, the unsatisfactory nature of recent development, and the rapid exhaustion of the payable ore reserves, the directors decided in December last to suspend operations, and to endeavour to lease the mine on tribute. Satisfactory arrangements with a tributor were in course of being concluded, when a bad crack was found in the crank shaft of the mill engine, and negotiations had consequently to be broken off. As a reliable crank shaft could not be obtained in this country, a new one has been ordered from Europe, and on its being installed, about April next, fresh arrangements will, if possible, be made for the leasing of the mine on tribute; meanwhile, all operations were suspended early in January, and the property has been left in the hands of a caretaker, who, with a few natives, will see to the buildings and machinery being kept in order.



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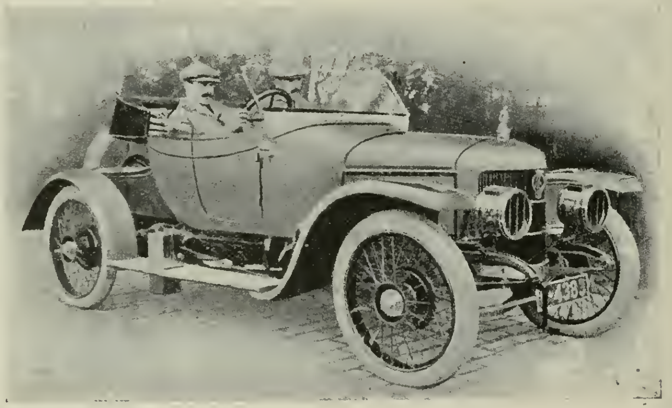

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Agricultural Machinery and Show Exhibits.

SPECIAL SUPPLEMENT—FEATURES DESCRIBED.

A VISIT to the recent Rand Show convinced even the most indifferent person to the development of the Union, that the immensity of agricultural resources, are fully grasped by the numerous firms specialising in irrigation and agricultural machinery. There is always the intractable individual to be met, however, who refuses to be taught or see eye to eye with the progressive person, and croaks that exhibitions, and such like arrangements, effect little purpose. Happily these narrow visionaries were practically an unknown quantity at the Great Show, and, therefore, a sweeping and unanimous verdict acclaimed it to be the largest and best yet attempted under the auspices of the Witwatersrand Agricultural Society. In the engineering sections, undoubtedly, the genius of the inventor was displayed on every hand.

The formal opening ceremony was entrusted to Sir Lionel Phillips, who, at the outset, regretted the absence of H.E. the Governor-General, and the Prime Minister respectively. In happy speech the President reflected the keenness he evinces in all matters pertaining to agricultural development. He considered that the Society could, indeed, be proud of the work accomplished, and complimented the able band of supporters whose enthusiasm made possible the gratifying conditions under which these shows were held. It gave him great pleasure to announce that the entries were the largest on record, exceeding the numbers of last year by no fewer than 473. In his opinion, however, the limited space prevented the many exhibits being displayed to the best possible advantage, and he urged on his hearers the necessity of strenuous efforts being made to provide sufficient accommodation for the years to come. He hoped that next year the irrigation machinery will be associated with large water tanks to enable the machines to be witnessed under actual working conditions.

The Government exhibition was as popular as ever, and came up to expectations. It shared much interest, not alone for the excellence of the exhibits benched, but from the practical and educative side of agriculture, with which it is identified. The experimental farms and stations, in the interests of cotton, tobacco, etc., throughout South Africa were well represented and much valuable expert information was imparted by the officials in charge.

Entries were received from all parts of the sub-Continent; the large coast towns contributed largely in one form or another; while excellent exhibits were sent down from Rhodesia by the British South Africa Company.

The influence of agriculture in this country, so rich in natural endowment, time alone will determine. The opportunities are greater—in point of population—than in any other part of the Empire, and the wish is echoed from all quarters that the time is not far distant when the exports of the country's agricultural and other products will largely exceed the imports. This desirable condition, however, can only be brought about as the landowners realise the great possibilities, and energise themselves in befitting fashion.

Messrs. Andrew and Thienhaus, Ltd.

One of the exhibits at the recent Witwatersrand Agricultural Show, which attracted considerable attention was one by Messrs. Andrew & Thienhaus, Ltd. This well-known firm showed sections of piping of various kinds besides a pavilion constructed entirely of stock lengths of their celebrated "Phoenix" piping and fittings. A 16 cub. ft. U shaped truck standing on a short length of track was also shown. But that which proved of greatest interest to the public, especially those interested in irrigation, was the wonderful Benz petrol-paraffin engine, of which we give an illustration. This engine, which exerts 8 h.p. at sea level, was driving a centrifugal pump, pumping against a head of 10 feet, throwing a very fine stream of water from a 4in. delivery pipe. The Benz engines, which are manufactured by the world-renowned firm of that name (who, by the way, recently not only scored a "Brookland" with its cars, but also received an award of £3,000 in connection with an exhibit of engines for aerial crafts), is noted for its simplicity of construction, having only one valve tappet which operates the exhaust valve. The governing is also worthy of attention, and is so arranged that when the speed exceeds the number of revolutions for which the engine is designed, the exhaust valve is held open, and consequently no charge is drawn into the combustion chamber. These engines start on petrol (a reservoir being attached on carburettor), which is first filled, then after engine has been in motion for a while, a valve is opened which admits paraffin. The ignition is by electric spark from magneto. The ignitor, which is of the make and break type, is actuated by the piston head and is constructed in such a manner, as to preclude trouble from this source. Three systems of cooling cylinder can be employed:—(1) Circulation system by means of the usual tank; (2) connection to water mains; or (3) evaporation system of cooling, which method is simplicity itself, and is conducive to great efficiency—on account of the great heat utilised. Where an engine is required to be portable, this system is desirable, as it does away with the cumbersome tank and piping. The consumption of fuel is very small, being 5/8 pint per horse power per hour. Lubrication is by splash, doing away with the danger of bearings seizing on account of insufficiency of lubricant, which is such a fruitful cause of trouble when the ordinary sight feed oil cup is used. These engines are well made in two types, with hit and miss type of governing for ordinary class of work, and with precision governing for electric lighting plants. In conclusion, we would add that the figure at which these engines can be obtained are remarkably reasonable. Any enquiries with reference thereto and for the following: Benz suction gas plants, Benz diesel oil engines, Benz mine locomotives, and irrigation plants of every description, will receive prompt attention from Messrs. Andrew & Thienhaus, Limited.

Shimwell Brothers.

This firm holds undisputed claim as the pioneers of the cycle industry in Johannesburg, and certainly few can speak with such authority on the transition of the ubiquitous bike in South Africa. Step by step the brothers have kept pace with this industry in all its varying stages, from the days of the old "bone-shaker" until the present-day luxurious machine. Some 30 odd branches, to-day, in the country exist to the credit of the brothers Shimwell. Through depression and boom they have more than held their own—with a fixed determination to succeed—since the days when Johannesburg was practically little more than a mining camp. That their efforts have been crowned with singular success goes without saying, as a visit to their Johannesburg headquarter establishment in Smal Street will testify. These premises will be found replete "from cellar to attic" with luxurious machines, fitments and accessories. No amount of plodding, however, could raise a firm to a premier position in the cycle trade, such as Shimwell Bros. enjoy, without the "sine qua non" of fair dealings and excellence of

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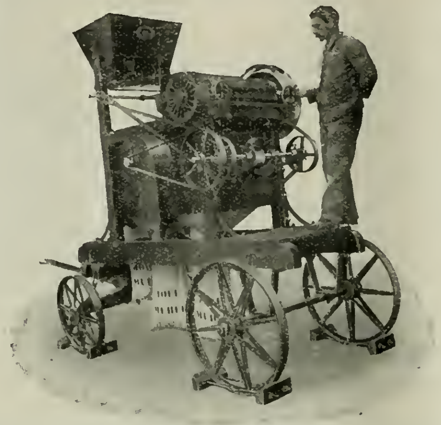

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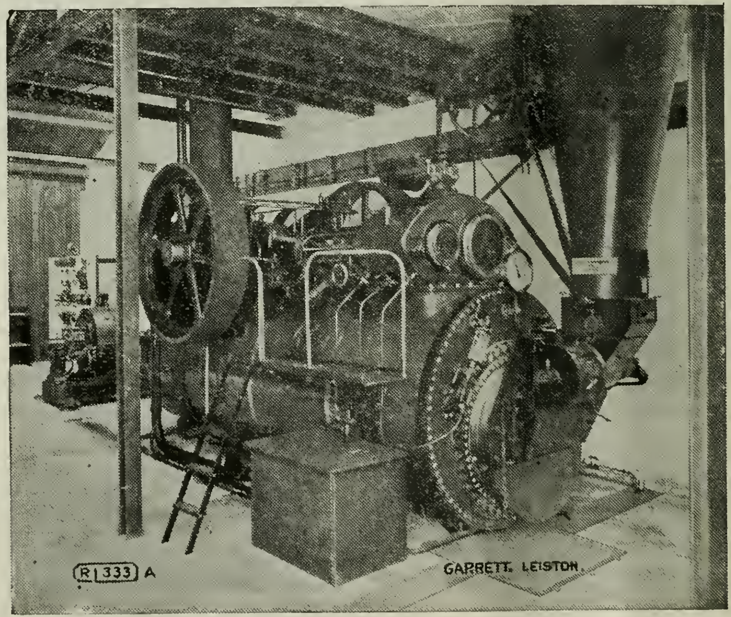

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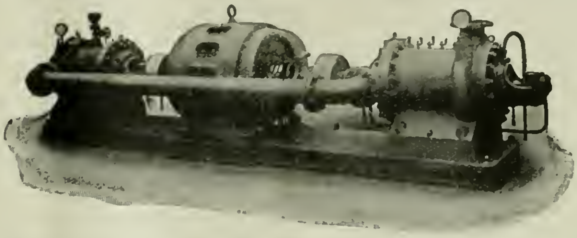

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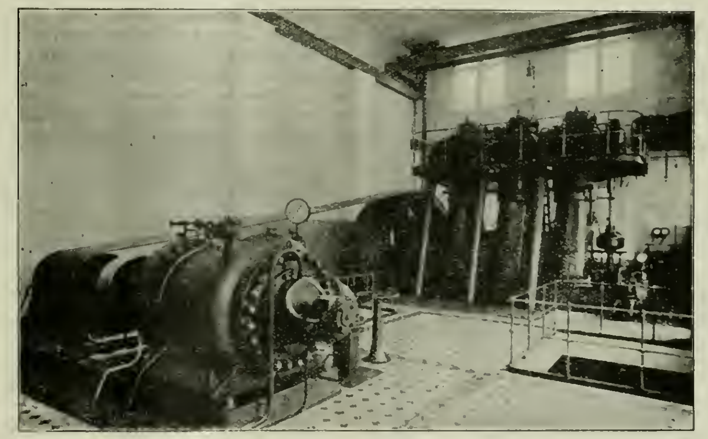

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machines, and workmanship, and herein lies the success referred to. In regard to machines on view, the names: Ariel, Aston, B.S.A., Enfield, James and Triumph need very little comment here. The last mentioned, on exhibit, appeared in very truth everything that the name suggests, and a great demand has been maintained for this cycle, since its introduction to South Africa. All the foregoing are being made to conform to the most exacting conditions of the undeveloped roadways of the country. The Colonial B.S.A. which was shown is a superb machine, strong, durable, affording high clearance and exceptional petrol capacity, and in other respects a very desirable machine. The display of firearms, by this firm, attracted sportsmen galore. Shot guns, revolvers and rifles—for target, sporting and many forms of the pastime—were all arrayed in tempting fashion, while ammunition, of the most improved kind, was shown in endless variety. The firm called for special attention to a new cartridge named the "Unity," expressly manufactured for South Africa. This cartridge is fixed in gas-tight cases to suit the requirements of various parts of the country. It has a very slight recoil, and is hard-hitting with a remarkable freedom from blow-back; and is sold with an absolute guarantee of reliability. It is manufactured by Messrs. Nobel, of Glasgow. A rifle, which appealed to all those interested in accurate work, was the B.S.A. Martin, which is made in several models, and finds a large and ready sale. The No. 7 of this type is described as an "arm-de-luxe," and is also known as the "Superb," and certainly bears out these names in their general acceptation. Shimwell Brothers' interests extend in various other directions, as the mechanical steam and other models exhibited testified. These, in their class, were complete in every respect, and combined towards the attractiveness of this most liberally stocked stand. An immense business, it is understood, has repaid this old firm for the infinite pains resorted to in contributing to the general excellence of the Show, by such a costly and elaborate exhibit.

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Stewarts and Lloyds (S.A.), Ltd.

This firm are the largest makers of piping and pipe fittings in Great Britain, and import into South Africa enormous stocks for mining, waterworks, and irrigation purposes. Samples were shown of ordinary screwed and socketed pipes in all qualities, Stewarts' patent inserted joint for lead, Kimberley joint, and all classes of flanged joints for low and high pressure, air, water and steam. Special attention was drawn to the latest form of patent inserted joint, the mouth of the socket is now strengthened by turning the metal over on the inside of the socket. Thus strengthened, the socket is universally admitted to be the finest obtainable for lead joint purposes. The exhibits in the valve section, covered all mining and farming requirements, including Hopkinson's boiler mountings and high pressure steam valves and fittings, Glenfield and Kennedy's hydraulic specialities, and special valves for cyanide works, etc., etc. There were several engines of the National Gas Engine Co.'s make, erected on this stand, and these were to be seen under working conditions. One of their gold medal suction plants was shown at work supplying gas to a 13¼ continuous B.H.P. National engine. This plant is fast becoming an important factor in the development of South Africa. Owing to the low fuel consumption, running costs are very much less than can be possibly obtained by any other means, and it is rarely that any other type of plant is installed for irrigation purposes where pumping costs are such an important factor. In many cases, the waste wood found on farms can be converted into charcoal suitable for use as fuel. Petrol and oil engines were also to be seen at work, and for design and workmanship we have not seen engines to surpass them. The display of Mather and Platt's centifugal pumps attracted much attention from mining engineers and farmers. These pumps are made in different styles to suit the varying duties to which they are put. For irrigation work, a number of very simple, inexpensive and yet efficient pumps were exhibited, capable of dealing with either large or small quantities of water. These are manufactured in various sizes to lift from ten to twenty-six thousand gallons per minute. The efficiency of these pumps is exceedingly high. They can be arranged for belt drive or direct coupling to a motor. The latter arrangement being compact, makes a specially suitable plant for underground work. For the high lifts, usually obtaining with mining work, a special class of pump is manufactured by Messrs. Mather and Platt. Several "Climax" windmills were erected on this stand, which were all shown at work. The sizes of the wheels vary from six feet to eighteen feet in diameter. This windmill, which is of Eng-

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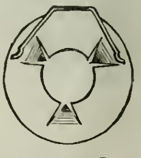
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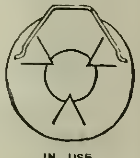
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lish make, has been awarded several gold medals, and is rapidly winning for itself an unrivalled reputation throughout South Africa. The latest pattern is fitted with double helical gears. This gearing ensures smooth and silent running, and gives the "Climax" the greatest possible efficiency Hand and power pumps were shown at work, and the many types exhibited met all possible requirements. This firm had erected a hand pump worked by one Kaffir, which delivered water at a distance of over a mile from the well, to a height of thirty feet, with highly satisfactory results. Blake's "Hydram" has been evolved after many year's experience in the manufacture of this type of automatic pump, and one of the "Hydrams" was shown at work. The cost of upkeep is practically nil, and all that is required in the way of motive power is a running stream with a fall of two feet or more. Wolseley sheep-shearing machines, of various types, were on exhibition, including a complete "portable-electric" set, which is entirely self-contained, embodying, as it does, petrol engine, dynamo, switchboard and motors, each fitted with its own flexible shafting and shears. The demonstration of this plant was in the hands of Mr. W. J. Newton, one of the most expert sheep shearers in Australia, who has come over specially to demonstrate the capacity of Wolseley machines. He has already given demonstrations at the Rosebank and other shows, where these machines created quite a sensation. Messrs. Stewarts and Lloyds go in extensively for constructional engineering, and have always contracts on hand for mining companies, Government Departments and private individuals. The supply and erection of complete irrigation plants are now being undertaken by this firm very largely throughout the country. The firm employ a competent staff to deal with engineering problems, and their advice on irrigation matters is of the greatest advantage to the farmer. Figures quoted by them are "practical" figures, and when advising on a scheme, Messrs. Stewarts and Lloyds get down to actual conditions and proved results, and so save their clients from theoretical pitfalls.

Remington Typewriter Agency.

The exhibit of modern office appliances by this Agency for the up-to-date business man attracted a constant stream of interested visitors. An inspection of the many specialised appliances, reveals at once a solution of the difficulties which, in the past, have confronted those dealing with a large volume of office work. The hall mark of celerity stamped the various machines, which are, at the same time, error-proof and similarly qualified in regard to mis-operation. The Remington typewriter, fitted with the "Wahl" adding and subtracting attachment, is a most ingenious device. This machine is specially used for billing, where any number of columns are required. In the Roneo-type duplicator, the business man is supplied with a real live office printing press. Every letter from this machine is an actual typewritten one. The Roneo Duplicator is invaluable to the business man, turning out circulars, reports, etc., at the rate of 100 copies per minute, at an approximate cost, less paper, of 4d. per 1,000. A marvellous invention was evident in the Roneo Letter Copier, which copies excellently at the rate of 15 to 20 per minute, a vast improvement on the water and damping sheet process of the past. Filing appliances in steel were among other specialities of the Agency's exhibit. They are in a position, in fact, to furnish any office equipment in steel, which, as they point out, has superseded wood, with results of a gratifying nature. The steel filing cabinet, on view, was a model of ingenuity. By its use the card index is dispensed with, while the ease with which it is possible to locate correspondence makes an appeal which none can afford to disregard. The Agency invite all interested to inspect this most up-to-date filing installation at any time. A wonderful time-saving device is furnished in the Edison Dictating Machine. The cylinders in this are detached, and sent out to be transcribed, and another cylinder is slipped on and one goes ahead. As many as ten letters can be dictated on each cylinder. The sale of this machine is rapidly on the increase. Other office appliances on view are stocked by the Agency, such as Gunn's Sectional Bookcases, loose leaf books, steel office wardrobes, desks, chairs, typewriter cabinets, etc., etc. The firm are also the sole appointed agents for Chubbs' fire-resisting and burglar-proof safes of world renown. The Rochester international time-recording clock is another interesting speciality of the Agency. The clock is in reality an automatic timekeeper, and, where numbers of men are employed, necessitating accurate time records, should prove invaluable if not indispensable.

Orenstein-Arthur Koppel, Ltd.

(Universally abbreviated: O.A K.).

A constant stream of visitors, during show week, was attracted to this firm's magnificent exhibit at the north-west corner of the Show Ground, particularly to witness the operations of the Sulzer centrifugal pump—driven by a portable 8 N.H.P. Garrett (Leiston, England) engine, discharging 2,000 gallons per minute, to a total height of 60 feet. The cost of raising this volume of water is infinitesmal, as, including interest on capital and redemption of plant, in a period of ten years, it works out a trifle under ¾d. (three farthings) per 1,000 gallons. A pump, responsible for such excellent results, must tend to revolutionize agricultural methods, and furnish new zest to this great branch of South African industry. The uses to which this engine can be applied are legion, and various plants, such as those employed in mealie-crushing, threshing, etc., are in turn driven by this valuable engine. Those visitors to the Show who expressed their surprise by "Allemachtigs," at the operations of this pump, would be surprised to learn that Messrs. Sulzer Brothers can supply to order, if necessary, pumps of the Helix type, capable of lifting 150,000 gallons per minute. Figures to juggle with! O.A.K. can, however, supply from stock in Johannesburg, pumps with a capacity up to 2,000 gallons per minute, and heads, up to 350 feet, for irrigation and mining purposes. The major portion of O.A.K.'s exhibit was confined to irrigation plants and agricultural machinery, and evidenced the enormous strides made of recent years in this class of engineering, in which the firm specialises. Alongside the pump described earlier there were running several of the diaphragm type, which, the agents point out, command on enormous sale in Northern Africa, their simplicity of construction providing for a remarkable ease of operation, even by hand power. It is only a matter of time until the economic value of the abovementioned is fittingly recognised in this country, when the vexed question of irrigation will come within easy solution. These pumps effectually supersede the old type of bucket pump, and are rendering an excellent service wherever they are installed. It is interesting to remark, in connection with the centrifugal pump, that the contempt meted out to it in the past, as opposed to the piston pump, has now given place to universal recognition, owing to the careful development process it has undergone, and to-day it successfully competes in nearly all branches with the piston pump. Singular success has attended their use in Egypt for example, experience having shown their special adaptation to lift large quantities of water to small heights, and, further, they are unaffected in action by water—such as that of the Nile—carrying a large amount of silt. There was also on exhibit a useful little oil engine of 7-10 h.p., driven by crude oil or paraffin, operating a 3-in. Sulzer centrifugal pump, with a lifting capacity of 55 gallons per minute, to a height of 60 feet. This engine proved of special interest to farmers, offering the unique combination of simplicity, power and durability. To the small holder it should make an irresistible appeal! The O.A.K. threshing machine, driven by a Garrett engine, was viewed in the light of a boon by the many farmers, to whom its facilities in dispensing with manual labour, was apparent at sight. Among the many farm implements handled by this firm the Disc Plough deserves special mention, in double and treble furrows, and which is fast superseding the type known as the "Mould Board" plough. The "Dains" hay sweep rake stood in a class by itself, being an implement capable of stacking 200 tons of hay in 10 days with only four natives in attendance, a recommendation which farmers, on the face of it, can ill afford to ignore. Much will be heard of this device in the future agricultural development of the country. Sales are on the ascendant and inquiries coming along with regularity. A sister implement works in conjunction with the former, i.e., the Dains' Hay Stacker, which can be worked by one animal, and stacks as quickly as the other performs its work of raking. Potato planting and digging machinery of the most up-to-date pattern came as a revelation to the townsman, who felt inclined to raise the cry: "Back to the land," in his tour of inspection of all these labour-saving devices. The O.A.K. enterprise finds outlet in many ways. In the direction of dairying, their claim on the farmer's attention is by no means insignificant, judging by the many appliances they offer. In an excellent range of cream separators and churns they aroused an interest in the breasts of established and prospective dairy farmers which purchases could alone appease, consequently orders followed freely. These separators—namely, the Durkopp—are gems of simplicity and usefulness, cleanly and easily kept in this necessary state. They are capable of skimming, according to dimensions, from 10 to 45 gallons per hour, and are indispensable to dairykeepers. The O.A.K. electric farm wagon is a marvel of ingenuity, and no pen-picture can earn for it a deserving appreciation. Mounted on solid steel wheels, its uses are indeed manifold. For example, it can be adjusted to transport live stock, with equal facilty to heavy machinery, while farm products, such as grain, hay, etc., in transport, came within its scope of operation. Ploughs, harrows, drills, and cultivators, in bewildering fashion, were exhibited in the special harvesting machinery section. These included such well-known types as the "Walter A. Wood," and the "Rud-Sack," all of which aim at simplicity in manufacture. The Disc Seed Drill, needed very little introduction to the South African public, as the methods for regulating the seed flow are fully recognised and account for the wide popularity it enjoys. The staple lucerne cultivator owes much to the "Spring Cultivator," a strong, useful implement, which was eagerly examined. The "Disc" plough, fitted with dust-proof interchangeable wheels, also needed very little explanation in point of utility. In addition, the firm's exhibit of ordinary ploughs was excellent; those for ridging, claiming more than a passing interest. The Reversible "Sack" plough is admirably adapted for employment on the hill side of farms, and conforms to the general excellence of this firm's implements. Cambridge rollers, "W. A. Wood" disc harrows, potato graders and diggers, planting and furrowing machines on exhibit, all combined to impress the visitor of O.A.K.'s foresight, in point of the actual requirements of the country; and the great agricultural future, which so largely hinges on the use of these modern productions. The capacity for hard and continuous work, however, exacting the ground may be, typifies all the firm's implements. The "Joel" Roller Mill is a machine of a compound nature, embodying several machines in one, and constitutes, in every sense, a perfect and complete milling plant, at a minimum of expense. Proof of this is not wanting in the fine flour obtained, as the result of its use. The farmer, first of all, must fence, and reference, perhaps, should have been accorded pride of place to the strong ,small-mesh fencing, known as the "Razo" on show, which was acclaimed, on all sides, as ideal for South African conditions. To the small holder it is simply invaluable, and, in addition, to lightness, combines a strength which is undeniable. The agents point out, among its many sterling qualities, the protection it affords the gardener and fine crop raiser, from the small destructive game with which many parts of South African abound. One turned away with regret from this magnificent display of agricultural implements, which forced the most casual observer to conclude that a painstaking study has been accorded—by the firm of O.A.K.—the great agricultural question to-day, and that the position has been improved by result of their research is a matter on which no two opinions exist in South Africa. It would be impossible to overestimate the value of the Diesel engine—whose interests are entrusted to O.A.K.—in the future development of the vast sub-Continent. The tendency nowadays is to accord manual labour a slight recognition, and instinctively to turn to machinery to aid work of all natures. In fact, to-day, it can be safely asserted that the introduction of machinery is imperative rather than optional. The rarest specimen of optimist could never hope that the great areas now lying undeveloped in South Africa, could ever be other than barren tracts, were machinery not requisitioned to assist. Progress demands it, and in the recognition of this claim it is the duty of those most intimately interested to procure the very best form of machinery for their respective purposes. In the Diesel engine—to use a familiarism—a great need has been met; its efficacy in a new country, such as this, holds undisputed sway. This is the day of the internal combustion engine, and the variety, in point of motive power, afforded in the many oils and spirits available, places users in a most advantageous position, contrasted with that of a few decades ago, when the choice was confined to steam and water power. Diesel motors have established a world-wide reputation which reflects creditably the determination of the manufacturers, Sulzer Brothers, to keep in step with the present rapid progress of civilisation, conformity to which alone ensures a firm's success. The Diesel engines can be successfully worked with the crudest oils, the residue of by-products, of the great refineries can be utilised to the best advantage. Crude oils, it is well known, embrace many features, such as high heating power, small bulk, cheapness and convenience of transport, etc. The marked superiority of the Diesel engine over steam and gas engines has been demonstrated conclusively throughout the world, and the fact that it can be depended upon at all times, under all climatic conditions, at a moment's notice, fulfills the primary requirements of this country, however exacting. In another section there was a splendid exhibition of the Mannesmann Tube Company's products. This company was formed in 1888 for the purpose of manufacturing weldless solid drawn steel Pipes in accordance with the famous invention of the Brothers Mannesmann, made some years previously. Small works, near Remscheid, were started with a few hundred workmen, and it took great efforts and heavy outlay of capital before the first difficulties of this, at that time, entirely new line of pipe-making were overcome. When the company had succeeded in reducing the costs of manufacturing to such a degree that they could compete against the ordinary welded piping on the market, the firm developed favourably and may be called one of the largest, if not the largest, concern in the world to-day, specializing in tubemaking of every description, and other solid drawn articles, such as cylinders for carbonic acid, oxygen a.s.o. The works of the company, which employ thousands of hands, are spread over England, Germany, Austria and Italy; salesbranches have been formed in all parts of the world, and the turn-over increased from a few thousand pounds at the beginning of the company to five million pounds sterling last year—certainly the best proof of the high-class material and workmanship of the company's products, which enjoy unique reputation all over the world. Some of the specialities of this company are: High-pressure mains for pump columns and hydraulic purposes, with special patent joints, standing pressure up to 15,000 lbs. per square inch; solid drawn screwed and socketted piping for steam and water; high-class boiler-tubes; solid drawn spigot and faucet piping in lengths up to 40 feet, made in one piece, for water, airmains and irrigation purposes; solid drawn telegraph and lightning poles rolled in one piece a.s.o. The company's general agents for South Africa are Messrs. Orenstein-Arthur Koppel, Ltd., Johannesburg, who carry large stocks of piping locally, as well as at the coast.

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Wevell Brothers.

The coachbuilding *par excellence* of this pioneer firm conveys the impression that the death-knell of the imported article has already been sounded. For, that the workmanship and general turn-out of the horse-drawn vehicle has been brought to a fine art by Wevell Bros. is already quite a matter of history, the name to-day being " household " throughout the length and breadth of the country. This great firm, so long identified with the carriage building industry, is essentially South African; inasmuch as the products used in manufacture, such as stinkwood, assegai, leadwood, ironwood, etc., etc., are all procured in the sub-continent. Among the many specialities of the firm are Ralli cars and Spiders, the exhibition awards in the former class—in front of their stand—being the cynosure of all eyes during Show week. Cape carts and buggies, phaetons and surreys, all bore the hall-mark of excellence in manufacture, and while smart to an irresistible degree, nothing, in point of durability it was clearly obvious is ever sacrificed to effect this result. Proof of this statement was not wanting in an old bakery cart on view, built by the firm nearly two decades ago, and which although in constant daily service on rough Rhodesian roads during this time, is not yet qualified for relegation to the scrapheap. Surely a striking testimony—if such were needed—to the excellence of materials and construction embodied in the vehicles of this old firm. The paintwork of their various productions also reflected the thoroughness of the methods employed, while the special study which the firm has evidently given to the peculiar climatic conditions of this country has alone been responsible for the perfection attained to. Mention must be made of coachwork of another highly specialised kind undertaken by this firm, namely, motor car bodies. A specimen of excellence in this direction was seen in the Municipal ambulance on show, the entire bodywork of which was manufactured in Wevell Bros.' local shops. It is hoped the day is not far distant when only chassis will be imported, and local body-builders, with a reputation like Wevell Bros. be entrusted with the work in this important branch of the automobile industry.

New Transvaal Chemical Co., Ltd.

The primary impression conveyed by a visit to this company's exhibit was the importance of encouraging the manufacture of local products. The artistic arrangement of the many-coloured specialities in soaps and candles, rendered this stall specially attractive, and users of the well-known " Surprise " commodity were quite at home in the atmosphere of the vicinity. The effect of the modelling in soap on the lines of Cleopatra's needle, and other designs, was very fine. The three great specialities manufactured by this company are " Surprise," " Blue-mottled " and " Carbolic," and the output in soap for the Transvaal alone exceeds 300 tons per month, being approximately two-thirds of the entire trade in this product. These soaps, it is important to remark, are manufactured with special regard to the conditions under which they are employed, exhaustive research by the company enabling them to produce a soap admirably suited to the water found in these parts; this, coupled with the supervision of recognised experts in soap manufacture, ensures to the buying public nothing less than the genuine article. The trade in candles in the Transvaal is roughly estimated at 1,100 tons monthly, of which this company contributes some 800 tons, and the wide range exhibited in these lines called forth unqualified surprise from hundreds daily. The " Royal " has for long held premier position in the candle department of the firm, and is popular throughout the entire Transvaal. The company manufacture a variety of products for the householder and farmer alike. As specialists in manures their claim to recommendation is fully established, in ways other than "cold print." This was evidenced by the enormous potatoes and other farm products on view, which were cultivated with the assistance of one or other of the company's manures. The manufacture of artificial manure by the New Transvaal Chemical Company has been a particularly successful enterprise. Fruit, flowers and vegetables thrive equally when treated with the firm's various manure specialities, irrespective of drought, or other adverse conditions, which usually militate against the efficacy of artificial manures. Soil treated with the products referred to has given excellent results, despite the recent drought, as testimonials from widely different parts of the country certify. At Delmore (District Boksburg) are manufactured all classes of manures to meet the proper requirements of farmers and gardeners throughout the country. These embrace the cultivation of tobacco, vines, vegetables, etc., etc. In disinfectants and acids, the company have also embarked in large enterprise, and a host of these were displayed which cannot possibly be described here. All preparations, however, are essentially South African, and pure in composition, which undoubtedly accounted for the great popularity the products enjoy. The motto of the firm in regard to many of their manufactures has for long been: " Beats the best imported," a phrase by no means inapt, as hundreds of South African housewives to-day can endorse. Full particulars can be obtained, by writing to the Delmore factory, of any of the Company's productions, or inquiries may be directed to the Johannesburg office, P.O. Box 1829.

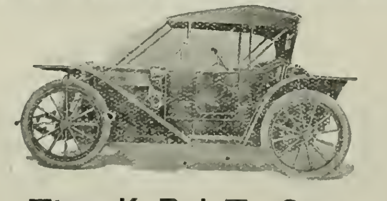
Blackhurst and Co.

Even a cursory inspection of the exhibits of this well-known firm convinced the visitor to the Show, that, in the Miller-Monitor wrought steel range a highly specialised article was being offered to the South African public. The general construction of these ranges—the only double-cased in the market—is of great importance to the householder, and should assure the ranges a ready sale. They are built with a view to economy, durability, cleanliness, perfect baking and general utility. All the tops, linings and water-backs are made of an extra heavy and refined quality of grey casting, and all the bodies, doors, ovens ,etc., are made of the heaviest and finest grades of homogeneous wrought steel, especially the bottoms of the ovens, which are extra strong, with heavy iron braces crossed and riveted underneath, and firmly bolted to the bottom of the ranges, to prevent them from warping. The steel plates used in the body are lapped and rivetted at the corners. The ovens are protected on top by a heavy flat piece of casting next to the fire chamber, to prevent them from being injured, should the coal be allowed to roll on top of the oven. All rivets used in the fronts of these ranges are countersunk, giving the range a smooth and well-finished appearance. The size and shape of the flues in connection with the fire chamber are constructed upon scientific principles, and have been adopted after repeated experiments, to heat the ovens evenly with the least amount of fuel and least time. The top frames are made of four separate pieces to prevent cracking. Due regard has been given every joint and part, in point of expansion and contraction, obviating all tendency to strain or wrench. Simplicity is embodied throughout in construction, and success is assured by the manufacturers to the purchaser, if the simple instructions laid down for setting up and operating the range are observed. Other specialities of this company include the famous " Wall Safe, ' the " Fastnut " washer—mentioned elsewhere—Refrigerators, etc., etc. The premises of the firm are situated in President Street, opposite the Town Hall, in course of erection.

Parker Wood and Co., Ltd.

The bee-line taken by so many farmers from the entrance gate to the exhibition of this old firm was very noticeable, and arriving there even the most fastidious and exacting among them could not fail to have his interest gratified to the full. The large stand occupied by the company displayed an excellent assortment of farm implements, making a direct appeal to hundreds, who were thence attracted. " Advance Agriculture " is clearly the motto which this firm has a peculiar right to adopt, as the up-to-date patterns of their products are designed to furnish an impetus to this great branch of S.A. industry, and set much of the manual labour associated so largely with farming in the past at a discount. Among the numerous exhibits, not the least attractive was the " Sunshine " harvester, shown in motion. It can be successfully used wherever grain ripens on the stalk. Climate and latitude are no bar to its use, if the summer heat be such as to permit the grain to fully ripen and mature on the stalk. It works under the vertical rays of the equatorial sun on the Nairobi tableland with equal facility of operation as that which characterises its use on the bleak tracts of Patagonia, as far south as latitude 42 degrees. It is specially designed for harvesting wheat, oats, or barley, and indeed purchasers use it for a variety of other crops, with excellent results. It certainly fulfills its purpose ideally. All its work is completed in one operation, and the attendant expenses of other operations—stooking, carting, stack-building, etc,—where other methods are adopted the " Sunshine " dispenses with, with obvious benefit to the users. This machine was invented and is manufactured by H. V. McKay, of Victoria, Australia, and affords a splendid object lesson in British manufacture. Several of these machines are in use in various parts of South Africa. The " Sunny Disc " plough, by the same maker, was exhibited in two, three and four furrows, and attracted more than passing attention. They are also built with that solidity and strength characteristic of Australian manufacture, and yet can be obtained as cheaply as the lightly constructed ploughs of foreign manufacture. Parker Wood and Co. have large consignments coming forward of Australian made implements. The firm also exhibited a full line of the famous " Oliver " ploughs, which made an instant appeal to the farming community. The Planet Jr. farm and garden implements made quite an interesting exhibition in themselves. The garden seeders and wheel hoes are well known to, and appreciated by, small holders and agriculturists in this country. All implements of this type are in every way economical, and combine simplicity, durability and ease of operation, in a very marked sense. They can be used with equal success on the hillside or on the level." Parker Wood and Co. also specialise in the " Aermotor " windmills, introduced to this country some 20 years ago, and during this long service have given unqualified satisfaction to the users, proof of which is evident in their ever-increasing sales, in the subcontinent.

Messrs. Harvey and Co., Ltd., were again one of the largest exhibitors of machinery, their stand being of interest to all connected with agriculture and milling. They have represented Messrs. E. R. and F. Turner, of Ipswich, for the last seven years in the Transvaal. The model cottage shown by the South African General Electric Co. was fitted with a patent air-gas lighting system. The gas was generated by petrol and shone with equal brilliance to electric. Messrs. Bartle and Co., Ltd., exhibited numerous lines of labour-saving devices, but few offered such attraction as the patent Lumley Washer. The firm also had on view a patent unpuncturable motor tyre, of which much will probably be heard in automobile circles. The agents for Jeyes' disinfectants, Messrs. Hirsch, Loubser and Co., occupied a prominent stand. Their placards notified the public that the entire show was treated with Jeyes' speciality. The fluid, powder and soaps, bearing the names of Jeyes are, of course, used in all South African homes, stables, kennels, etc. Under the directions of the B.S.A. Explosives Co., some interesting demonstrations of farming with dynamite were carried out. Experiments in farm drainage by this method also claimed special attention from large crowds. Brief mention must be made of the successful 2nd Annual Motor Exhibition, held in connection with the Show. The cars were staged at the north-east end of the ground, and were representative of the extensive automobile industry in these parts. The 2-seater " Prince Henry " Vauxhall was certainly the car super-excellent on exhibit, while the new model 20-h.p. Austin, shown at the last London Olympia, was easily the best in its particular class. The famous 3-ribbed, " manufactured for the tropics " tyres, as specialised by the Continental Tyre Co., were shown in the different grades of manufacture, and among other lines there were noticeable the firm's " Standard " solid tyres, for heavy vehicles. The " Dunlop Grooved " pattern tyres, on exhibit, were recognised by many motorists, whose impartial records prove the wonderful mileages accomplished by these tyres. New lines in accessories were staged by the Johannesburg Vulcanising Works the old-established firm of tyre specialists.



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NOTICE is hereby given that the Agreement between PETER ARTHUR WALSH and THE TUBE MILL PATENTS CONSOLIDATED, LIMITED, dated 21st May, 1912, whereby the said P. A. WALSH granted to the said Company the right to manufacture Tube Mill Liners in accordance with his Patent No. 57/1908, was cancelled on the 22nd day of January, 1913.

Any person or Company wishing to use the said Patent on a Royalty basis must please communicate with Mr. WALSH, 132, Marshall Street, Johannesburg.

JOHANNESBURG, 31*st March*, 1913.

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Solicitors for P. A. Walsh.

Specimen copies of the *South African Mining Journal* can be had from our offices at 125, Salisbury House, London Wall, E.C.

Finance, Commerce, and Industries.

The Pemba-Nyassa Railway.

The report by Messrs. Pauling & Co. with regard to the survey of the Pemba-Nyassa Railway was to have been made by the 31st inst., but as the survey expedition is not expected to arrive back at Porto Amelia until the end of this month, it will probably be about the middle of June before it is issued. It is expected that the report will be of a satisfactory character. The length of the line will be some 400 miles. The importance of the proposed railway to the territories lying between Porto Amelia, situated on the shores of the magnificent natural harbour of Pemba Bay, and the eastern shore of lake Nyassa, can hardly be overestimated. It will, indeed, form one of the chief highways of Central Africa. The route to be traversed covers land which, from an agricultural point of view, is said to be second to none in Africa, and it is confidently believed that the country hi highly mineralised. Large deposits of iron ore of excellent quality, from which the natives manufacture knives, etc., are known to exist, and excellent beds of steam coal have been located. The question of making Porto Amelia a port of regular call is at present said to be engaging the attention of the Union-Castle Steamship Co.

* * * *

Railways and Harbours.

In a report issued last week, the Select Committee on Public Accounts deals with the Railways and Harbours Estimates. The Committee considers that the Administration are not justified in incurring the thousand per annum on the purchase of Indwe coal in excess of what would have been paid if the same amount of coal had been bought from Natal, Transvaal or Free State collieries. The general manager's report for 1911 shows that the number of employees per 100 miles of line operated is 537 compared with 410 in Australia. The Committee regards this number as somewhat excessive, and recommends that the most careful scrutiny be maintained over all new appointments, and that every endeavour should be made to check any increase of the staff out of proportion to the traffic. The Committee directs attention to the general manager's opinion that the provision for depreciation of the permanent way and works is inadequate, but in view of the fact that a departmental committee is now enquiring into the matter, the Committee makes no further comments thereon. The Committee further suggests as a matter for serious consideration whether it is worth while keeping open the sleeper factories at Knysna and Storms River, in view of the small number of sleepers obtained under existing conditions.

* * * *

Resources of the Union.

The report on the work of the Imperial Institute for the year 1911 was presented to the Imperial Parliament towards the close of last year. The report makes frequent allusions to research work carried on by the scientific and technical department into South African products, this department working in co-operation with the Agricultural and Mines Departments in the various Dominions and Colonies of the Empire. Under the head of "Mineral Surveys," research work into African ores and deposits claims considerable prominence, though the Union is but modestly mentioned. A concentrate from the Transvaal was found to contain 95.52 per cent. of osmiridium (containing about 15 per cent. of iridium), 1.24 per cent. of gold, 0.61 per cent. of platinum, as well as a little iron and nickel. Other samples examined include graphite and brown umber from Natal. The minerals received from Rhodesia for examination included twelve samples of gold ore. Four of these, says the report, yielded enough gold to repay working, the best sample containing 1 oz. 10 dwt. 14gr. per ton. The possibilities of the Empire in respect of cotton growing may be judged from the fact that samples of cotton were submitted from the Sudan, Nyasaland, Uganda, Rhodesia, the Union of South Africa, British West Africa, India, Ceylon, New Hebrides, West Indies and Egypt. The possibilities of fibre, cotton and rubber samples from the Union are exhaustively reviewed at the close of the report of the Scientific and Technical Department, and it is stated that an increasing number of inquiries of a commercial character, involving scientific and technical questions, is being received by the Institute each year. These requests are chiefly of two classes: (1) Requests for advice from officials of technical departments in the Colonies and India as to the cultivation of new products, the commercial value of little known materials, or methods of marketing produce; and (2) requests from merchants and manufacturers chiefly in the United Kingdom for information as to new sources of raw materials, advice regarding the production of raw materials in the Colonies, etc. The number of such inquiries in 1911 was three hundred and eighty-six, exclusive of those relating to settlement, emigration and other similar matters, referred to elsewhere. A large proportion of these inquiries concerned food-grains and feeding-materials, and oil-seeds and oils, principally, no doubt, as the result of the dearness of these particular raw materials in 1911. An increasing proportion of these general inquiries relates to problems of tropical agriculture and forestry, special interest being shown in 1911 in the cultivation of the following products: rubber, cotton, tobacco, cocoanuts, oil palm, coarse fibres, soy beans, linseed, groundnuts, tropical fruits, and camphor.

A light battery, consisting of three 250 lb. stamps, has been received from England by the Manicaland Mines Department for hire to small claimholders so as to allow of trial crushings being made and also to enable a claimholder to work his property for a profit in the earlier stages of development, without his being put to the expense of purchasing plant.

MINING MEN AND MATTERS.

Mr. T. B. Reynolds, Chairman of the Globe and Phoenix, will visit the mine this year.

* * * *

Mr. J. E. Jones was elected chairman of the local Stock Exchange this week, and Mr. J. H. L. Manisty vice-chairman.

* * * *

Mr. H. H. Webb, Consulting Engineer to the Consolidated Gold Fields of South Africa, is visiting Rhodesia in the interests of his firm.

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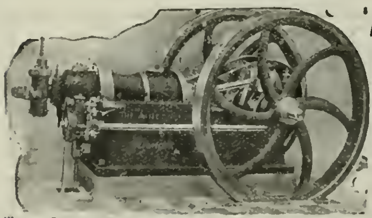

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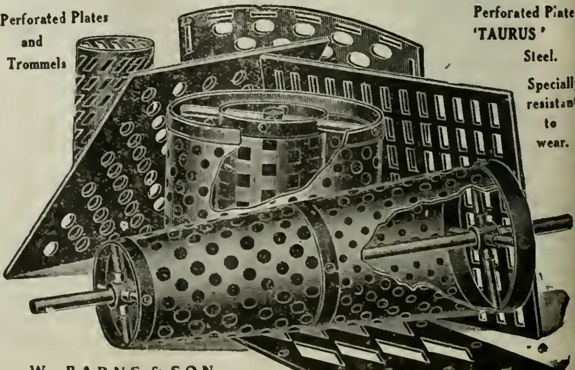

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Geological Survey of Manicaland.

The work of the Geological Survey has been rendered especially difficult this season owing to the want of native food in the Mossurize and Moribane districts consequent on the failure of the rains last wet season, says the journal of the Territory. The establishment of food depots before the arrival of the Survey party would, under the existing conditions, have involved a very considerable expenditure, and the Survey party consequently decided on starting work at such a distance south of Macequece as would enable it to draw on that town for its food supply. The Survey party left Macequece on the 6th June, and on the 10th inst. a base camp was established on the Munhinga River at the point where the Macequece Chaia eastern route crosses that stream at a distance of 67 kilometres 42 miles south of Macequece. The Munhinga Valley was examined up to the frontier, where the country rises to a height of 6.000 feet above the sea, the grounds being tested at numerous places both on the Munhinga main stream and on its tributaries. A preliminary traverse was then made southwards from near the headwaters of the Munhinga southwards as far as the Sambidzi stream, thence eastwards, and finally north to the base camp. The country in the vicinity of the Macuta Range was then investigated, and the examination of the Munhinga Valley completed as far as the junction of the Yamakanda with this river. Ancient workings of considerable interest were met with at Bandiri, and were very thoroughly investigated. The survey was then carried along the southern flank of the Macuta hills, thus completing the circuit of this range, westward to Chaia, and thence back to the base camp on the Munhinga. In the middle of August, the Survey party again left the base camp, following the Munhinga valley westwards until close to the foothills of the frontier scarp and then turning northwards on the old western Chaia Macequece road, established a camp at the point where this road crosses the Inhamagnena River. From here a strip of country between the Inhamagnena and Bondi rivers was first examined, including the ridge known as Baboon's Kop. The region lying between the Zone and Munhinga Rivers was then investigated, and this work included the prospecting of portions of the Pireze, Pandenhe Bonde and Inhamagnena streams.

The Diamond Regie.

The annual meeting of the German South-West African Diamond Investment Co. took place in Capetown on Saturday. The directors' report, which was adopted, stated that the nominal capital was £150,000, of which £99,924 was issued. During the current year the taxation on the production of diamonds in German South-West Africa had been changed. The new tax, which would be in force in future, was imposed on the profit made, while the old tax took the form of an export duty levied on the gross value of the diamonds. Althought this change in the basis of taxation had been effected, the mining companies in which this company was interested had not as yet resumed work, as the controversy in connection with the field tax was still unsettled.

INVESTORS' DIARY.

The following company meetings have been announced:—

April 25.—Worcester Exploration Co., at Worcester. C.P.
May 10.—Roberts Victor.
May 21.—Apex Mines; New Kleinfontein.
May 27.—Transvaal Coal Trust; Brakpan Mines; Springs Mines; New Era Consolidated.
May 29.—Roodepoort United; West Rand Consolidated; Meyer and Charlton; New Goch.
May 30.—Sacke Estates; Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries.
June 3.—Moderfontein B.; Robinson.
June 4.—Rose Deep; Village Deep.
June 5.—Durban Roodepoort Deep; City Deep.
June 6.—Bantjes Consolidated; Geldenhuis Deep; Crown Mines.
June 18.—Rand Mines.
July 15.—Transvaal Consolidated Lands.

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The following tenders were accepted by the Union Government for public buildings during the month of February, amounting to £96,808 18s. 7d. :—Erection of dipping tanks, Lower Umzimkulu Division, Natal; Mr. G. K. Schmalz, Port Shepstone. Erection of dipping tanks, Mluzini, Eshowe and Mapumalo Divisions, Natal; Mr. J. J. Cummings, 45, Theatre Chambers, West Street, Durban. Erection of dipping tank, Inanda Location, Natal; Mr. H. Brown, 32, Berea Road, Durban. Erection of dipping tanks at various places in Natal; Mr. H. G. Gordon, Richmond, Natal. Erection of charge office and mortuary, Benoni; Mr. G. Marnoch and Co., Box 299, Benoni. Erection of school for forty-eight pupils and teachers' quarters, Schoemansfontein No. 421, Klerksdorp; Mr. T. F. Scott, Box 4717, Johannesburg. Alterations and renovations to residency, Kentani; Mr H. Schwartz, Koffyfontein, Orange Free State. Erection of dipping tanks, Umlazi and Alexandra Divisions, Natal; Mr. H. Brown, 32, Berea Road, Durban. Erection of dipping tanks (cattle), Nkandhla, Entonjaneni, Alfred, and Lower Umfolosi Divisions, Natal; Mr. Emil Rodel, Estcourt, Weenen, Natal. Erection of dipping tanks (sheep), Nkandhla, Entonjaneni, Alfred, and Lower Umfolosi Divisions, Natal; Mr. Emil Rodel, Estcourt, Weenen, Natal. Painting warders' quarters at prison, Krugersdorp; Mr. C. McLachlan, Box 4206, Johannesburg. Repairs and renovation South African Public Library, Capetown; Messrs. F. Bakker and Co., Rondebosch. Removal of police barracks, Amersfoort; Messrs. Heard and Steer, Box 80, Standerton. Painting hospital, Germiston; Messrs. Smetherham and Wilkinson, Box 2558, Johannesburg. Erection of Normal College, Heidelberg; Messrs. M. J. Adams and Co., Box 3535, Johannesburg. Erection of motor garage for General Post Office, Johannesburg; Messrs. Proudfoot and Co., Box 2569, Johannesburg. Erection of sanitary annexe to Berg Street School, Pietermaritzburg; Messrs. Peattie and Stannard, P.O. Box 35, Pietermaritzburg. Erection of Magistrate's residence, Boshof; Mr. J. Lee, Box 342, Krugersdorp. Erection of police buildings, Boshof; Mr. P. W. S. Birnie, Box 367, Krugersdorp. Erection of police buildings, Hartebeestkop No. 57, Barberton; Messrs. Fairbairn and Wilson, Box 87, Ermelo. Additions to George Goch School, Witwatersrand; Messrs. Templar Bros., Box 161, Johannesburg. Alterations and additions to Albert Street School, Durban; Mr. Joseph Horner, 145, First Avenue, Durban. Additions to school, Clocolan, Orange Free State; Mr. F. W. Francis, Ladybrand, Orange Free State. Erection of dipping tanks, Natal and Zululand; Messrs. Stanley, Jackson Bros., Vryheid. Erection of lock-up and removal of police buildings from Broedersrust and re-erection at Louwsberg; Messrs. Lange and Still, Vryheid, Natal. Repairs to school, Christiana; Messrs. Powell and Rees, Maquassi. Supplying locker desks and forms for boys' college and high school, Pietermaritzburg and Durban; Mr. W. F. Johnstone, Pietermaritzburg. Erection of police buildings, Empangeni, Zululand; Mr. Thos. Poynton, Prince Alfred Street, Durban. Alterations and additions to post office, Benoni; Mr. Arthur Ruffels, 18, Fourth Street, Boksburg North. Painting Government Buildings, Krugersdorp; Messrs. Hudson and Lewis, Box 365, Krugersdorp. Painting Government Buildings, Germiston; Mr. A. W. Jefferson, Box 2044, Johannesburg. Erection of new closet to cells at police station, Douglas Street, Bloemfontein; Messrs. Jacobson Bros., 56, Fichardt Street, Bloemfontein. Building bathrooms at asylum, Grahamstown; Messrs. Moore Bros. Rebuilding Gilfillan Bridge over the Fish River, Cradock; Messrs. Murray and Stewart, Greenmarket Square, Capetown.

ANSWERS TO CORRESPONDENTS.

E. C. K. B. (Pietersburg).—The address of the first-named is New Club, Johannesburg.

"J. A. M." (Bethlehem).—Your request is under consideration.

Ceitho (Bulawayo).—We would advise holding, having regard to present low price. The company recently has acquired additional claims and has fair prospects.

J. M. Keir.—We do not think you would be well advised to vacate any fairly decent billet here for the places you name unless guaranteed employment. We cannot reply to correspondents under separate envelope.

J. McLeod.—From Johannesburg the quickest route to Fort Jameson is via Broken Hill in North-Western Rhodesia. There are no railways in North-Eastern Rhodesia. Fort Jameson lies in a due east direction from Broken Hill, from which place it may be reached by about 17 days' hard marching.

ROOM AT THE TOP

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine-drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics. — E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, corner Eloff and Pritchard Streets; Box 2061.

New Patents.

670. Walter Samuel Steljes.—Improvements in and relating to type-printing electric telegraph systems.
671. Thomas Hodgson.—Improvements in motor-car and other vehicular spring suspension mechanism.
1. Emil Ullmann.—Improvements in bottom discharge trucks and the like.
2. John Gattens.—Improvements in rock-drills and similar tools.
3. Giuseppe Antonie Pietro Provay.—Improvements in truck tipplers or means for discharging ore contents of trucks and the like vehicles.
4. James Hamilton Anstruther Macadam.—Improvements in apparatus for recovering diamonds and other stones from matter containing the same.
5. Charles Frederick Hall.—Improvements in valve devices applicable for closing the ends of pipes and the like.
6. James Stuart.—Improvements in or appertaining to shaking tables or the like apparatus for recovering diamonds from matter associated therewith.
7. Thomas Sutton.—Improvements in ore feeders.
8. John Theodore Prestige (Dr.) and (2) Albert Alfred Mead.—Improvements in ventilating means for railway and other vehicles.
9. Charles William Bick.—Improvements on or relating to the springing or suspension mechanism of motor vehicles.
10. Harley Escreet.—Improvements in pipe connections, coupling and the like.
11. Thomas Thomson.—Improvements in drills or bits for rock-drilling machines.
12. Miels Johan Sundin.—A new self-lifting curtain pole bracket.
13. Leopold Busse.—Improvements in horse shoes.
14. James Fowler Harker.—Improvements in buffers and coupling for railway and road vehicles.
15. Harry August Stockman.—Improvements in apparatus for washing and concentrating diamond bearing material, alluvial metalliferous matter and the like.
16. Pascal Marino.—A process of preparing electrolytes for use in the deposition of a metal or metallic alloy.
17. John Sellers Bancroft and (2) Mauritz Christian Mdahl.—Improvements in or relating to positioning, adjusting or centreing mechanism for type machines.
18. Gustav Adolphus Sheeley.—Improvements in connecting steel or/and wrought iron into cast iron.
19. Herman Leinweber.—Air ships.
20. William Tippiatt.—Improvements in catches or fastening devices for sliding doors, partitions and the like.
21. Fabian Mercer Cox.—An improved caisson and air-lock for the recovery of diamonds, precious stones and metals from deep waters.
22. (1) Thomas Donaldson (2) Gilbert Frederick Ayers (3 The British South African Explosives Co., Ltd.—Improvements in fuse lighters.
23. Arthur Herbert Gaydon.—Improvements in means for emptying cans or other vessels containing paraffin oil or other liquid.
24. Frederick Boesser.—Turbine washer for drinking glasses, and other vessels.
25. Hugo Velten.—Improvements relating to ore dressing apparatus.
26. Sampson Charles Williamson.—A machine and process for the extraction of solution and liquids from sands and slimes and kindred substances connected with gold and mineral extraction.
27. William Griffiths.—Improvements in furnaces for smelting gold slimes.
28. (1) British Insulated and Helsby Cables, Ltd. (2) Rowland Wrench Blades.—Improvements in electric cable connection boxes or apparatus.
29. Herbert Hepworth Thompson.—Process for forming expanded metal.
30. Hugo Altschul.—Improvements in internal combustion engines.

H. BRAMLEY'S SALES.

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WITHOUT RESERVE.

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The Ariston Mine, Klerksdorp

ON THE COMPANY'S PROPERTY, ABOUT FOUR MILES FROM KLERKSDORP,

On Tuesday, May 6th, 1913, at 10 a.m.,

The whole of the Company's Assets, consisting of:—One Block of 53 Claims, 10 Stamp Battery. Crusher, Tube Mill, Ball Mill, two Sand Settler Tanks, four Sand Treatment Tanks, two Slimes Settler Tanks, two Slimes Treatment Tanks, three Solution Tanks, one Clarifier Tank, one Steady Head Tank, one Clean-up Tank, one Clean-up Filter Press, three Extractor Boxes, Sands and Solution Pumps, one Storage Water Tank, Pipes and Fittings, Trucks, Tramline, Assay Plant, Scales, Tools, Stores, etc., etc.; 3 LOCO BOILERS, each 30 h.p., passed for 100 lbs. pressure; 1 TANGYE'S ENGINE, 16in. by 36in.; 1 WINDING ENGINE; Shop Lathe, Zinc Cutting Lathe, Electric Generator, Small Air Compressor, WATER-RIGHT ON THE SCHOONSPRUIT, WITH PUMPING PLANT, and 3 in. Pipe Line about 1½ miles in length.

BUILDINGS, comprising:—Mill and Workshop, Office, Store, Laboratory, Single Quarters, Manager's and other Houses, Native Compound.

The Mine is still in full swing Everything is complete in every respect and in good working order, so this Sale affords an opportunity of picking up bargains which should not be missed, as everything will be sold WITHOUT RESERVE.

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H. BRAMLEY,

Auctioneer and Government Sworn Appraiser.

Klerksdorp. April 3rd, 1913.

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Notes and News.

The March Output.

The salient figures of the Transvaal gold output for March, as declared on Thursday by the Chamber of Mines, are as follows:—Total output, 790,552 ozs., value £3,358,050; increase 56,430 ozs., value £239,698. Rand output, 760,324 ozs., value £3,229,652; increase 57,930 ozs., value £246,071. Outside districts, 30,228 ozs., value £128,398; decrease, 1,500 ozs., value £6,373. Total stamps, 9,987; increase, 59; Rand, 9,475, increase 100; outside, 512, decrease 41. The group returns appear elsewhere in this issue, and the usual monthly tables will appear next week. The native labour returns, according to the Native Labour Association figures, continue to show an increase; there is an addition of 1,326 to the February total, which brings the number for March to 213,783, the highest yet reached.

* * * *

City Deep.

The following cable has been despatched to London "Board of directors have provisionally agreed to sell to City and Suburban G.M. and Estate Co., Ltd., about 15 claims adjoining south-eastern boundary City and Suburban G.M. and Estate Co., Ltd. Terms will be submitted to the shareholders on an early date."

* * * *

New Thor Diamonds.

A meeting of the shareholders of this company will be held at Bloemfontein on the 12th June next to pass the following resolutions:—(a) Reducing the capital of the company from the sum of £29,000 in 232,000 shares of 2s. 6d. each to the sum of £14,500 in 116,000 shares of 2s. 6d. each. (b) Increasing the capital of the company from the said sum of £14,500 to the sum of £50,000 by the creation and issue of 284,000 new shares of 2s. 6d. each; and also to confirm an agreement by which Mr. Bernhard Oppenheimer, acting on behalf of Messrs. Lewis & Marks' Diamond Branch, Ltd., and undertaking the total subscription of 116,000 shares in the increased capital, shall receive an option for one year over the reserve shares to be created. Finally, to consolidate and alter the existing shares, and those to be created, from 2s. 6d. to 5s. each.

* * * *

Breyten Collieries' Erection of New Plant.

Work generally at this, the newest of the Transvaal collieries, is proceeding satisfactorily and everything tends to confirm the sanguine opinions formed of the property. Additional plant is now being erected with a view to increasing the output as from the 1st of July next. The company has already entered the dividend-paying list and is likely to distribute considerably more amongst shareholders in the near future.

* * * *

Brakpan Mines Past Quarter's Results.

A quarterly report has just been issued by the Brakpan Mines Company, which brings the results of the company's operations up to the end of March. In this report it is recorded that the development for the quarter amounted to 3,882 feet, of which 2,615 feet were on reef, averaging 7.8 dwts. over a reef width of 37.6 ins. Of the ore sent to the crushing and sorting station 17.1 per cent. was rejected as waste rock, and 170,414 tons were milled. The total yield was £255,485, or just under 30s. per ton. Working expenditure was at the rate of 17s. 5.6d. per ton and the resultant profit was £106,639 12s. 6d. per ton. It is stated "the profit was adversely affected during March owing to the coincident interruption of work in five stope faces as a result of subsidence of the hanging wall. As a consequence a decreased tonnage of somewhat lower grade was milled and working costs were above the previous month. The matter is of but temporary and incidental significance. Two faces have already been recovered, and the others will soon be again available." The report bears date April 7th, and has been issued with remarkable celerity.

Crown Mines Ore Reserves.

The reports of the Directors, of the Consulting Engineer and of the General Manager of the Crown Mines contain many features of remarkable interest, as of course befits the annual statement of the world's leading gold mining company. The most important and spectacular of these is that relating to the ore in reserve at the end of the year. The tonnage was 10,607,671 tons of a value of 7.09 dwts., or 29s. 9d. per ton. This compares with 10,124,072 tons at the end of 1911, 6,282,719 tons at the end of 1910, and 3,916,593 tons at the end of 1909. It will be appreciated from these figures that whilst all the reconstruction of surface equipment, the reorganisation of underground work and the earning of huge profits have been proceeding, the management has pursued a development policy which has been productive of magnificent result. Perhaps it may best be brought home to shareholders how strong the position in regard to developed ore at this property is when we state the value of the reserves at the end of the year was approximately sixteen million pounds.

* * * *

The Robinson's Record.

Since January, 1888 and up to the end of last year the Robinson Gold Mining Company had produced 4,115,137 ozs. of gold, equivalent to 13.783 dwts. for each ton of ore milled. The total revenue stands at £17,300,362, or 57s. 11d. per ton. Working expenditure over this period has called for £5,866,933, or 19s. 7.8d. per ton, and the working profit earned has been £11,433,429, or 38s. 3.5d. per ton. These are impressive figures, and they constitute what must be considered the finest records for any single gold mine in the world to-day. The Crown Mines, with its greater mining area and larger equipments, is, of course, rapidly forging up to the totals above mentioned, but it will be sometime yet before these figures are eclipsed. This year the development of the Robinson is expected to be completed, and in future the company will have to pursue a lower grade policy. The grade last year was 43s. 8d. per ton, which, although higher than that of 1910, was lower than the 1911 showing or that of any other year in the history of the company.

* * * *

The Wanderer.

In reply to a cable from the directors asking what influence upon the life of the mines the new strike is likely to have, the Consulting Engineer of the Wanderer has cabled that the new chute is opening out well. There are already developed 10,000 tons of a reduced assay value of 5 dwts. He thinks that the Camperdown Mine will be worked out by the end of June, when the output will be reduced to 6,000 tons per month, or one-third of the present production. He mentions, however, that he will be able to work at a profit until June, and also at a profit on the reduced tonnage.

* * * *

National Diamonds.

Nothing is more interesting and significant in the history of the old Schuller and present National Diamond Company than the fact that Messrs. Lewis and Marks, who rejected the property several years ago, should have come forward again so readily to finance the concern. But for the persistence and courage of a few persons of comparatively small means, who have kept the mine going in a spasmodic way during the last three or four years, it is not unlikely that the owners would have been glad to sell the property for a mere song long before now. It is rumoured that another group, who do not figure in the recent transaction, are associated with Messrs. Lewis and Marks. However that may be, the shareholders are to be congratulated upon having had their holding placed upon a sound financial basis by a house of so excellent a standing.

* * * *

Cape Petroleum.

We understand that borehole sites have been located in the Ceres District of the Cape Province on behalf of the Consolidated Oil Fields of South Africa, Limited, and it is expected that work will be commenced at an early date. The sites chosen are in the neighbourhood of a place where evidences of natural gas, as appears in a report signed by Sir Boverton Redwood, have been found.

The Mining Exhibition.

The Minister of Mines (the Hon. F. S. Malan, M.L.A.) has written to the Secretary of the second Mining Exhibition which is being promoted by the Chemical, Metallurgical and Mining Society, stating that he is convinced that extremely valuable educational results may be anticipated from these exhibitions, and wishing the Society every success in the Exhibition to be held during the last fortnight in this month. One of the principal objects of the Exhibition is to enable the small inventor of any device or apparatus of use to the mining industry to bring his invention to the notice of the mining community and the public generally. The last exhibition was the means of enabling several inventors to make satisfactory arrangements with commercial firms for placing their inventions on the market. Up to the present while the commercial element has taken up all the space available for their exhibits, inventors have not taken that full advantage of the opportunity afforded them by this exhibition for the showing of the many ingenious devices, which are known to abound, intended for use on the mines along the reef. Admission to the Exhibition, which will be opened by the Administrator of the Province, Mr. Johann Rissik, on the 16th inst., will be free.

* * * *

Central Mining Profits in March.

Profits earned by the companies of the Central Mining and Investment Corporation group for the month of March amounted to £535,407, or about £60,000 more than in the short month of February. The seven mines of the "Eckstein" companies of the group operated the same number of stamps and of tube mills as in February, but crushed nearly 31,000 tons more, and the profit advanced from £233,575 to £255,230. The Rand Mines subsidiaries had the same number of stamps and tube mills in operation, but crushed 462,510 tons as compared with 409,300 tons in the preceding month, the profit improving from £241,809 to £280,177. The Modderfontein B. Company's profit advanced from £33,229 to £37,988, and that of the New Modderfontein was a little better at £49,299. The City Deep crushed 45,400 tons as against 41,900 in February and the earning improved from £27,329 to £32,623. The Village Deep earned nearly £2,000 more and the Village Main Reef, Robinson and Bantjes Consolidated each recorded improvements. At the Crown Mines working costs were 16s. 9d. per ton as compared with 17s. 10d. There were milled 201,000 tons as compared with 170,000, and the profit advanced from £113,970 to £128,193. The Geldenhuis Deep milled an additional 5,800 tons, and the profit at £16,120 was 40 per cent. better. The Rose Deep and Nourse Mines earnings were each about £3,000 higher, and the Ferreira Deep declared £65,695—over £10,000 more. The Durban Roodepoort Deep also showed a small improvement.

* * * *

Mining in German East Africa.

From the official reports on the German Protectorates in Africa, published by the German Colonial Office, we extract the following: In German East Africa gold mining, which in the year under review was almost exclusively confined to the territories of the Kironda Gold Mines, Ltd., for the first six months followed a normal and undisturbed course, but later heavy water caused an interruption, and although steps for increasing the pumping plant were taken at once, the output of the second half-year fell 20 per cent. Nevertheless the company was, for the first time in its history, in a position to pay a dividend of 8 per cent. The gold extraction averaged 45.9 grammes as against 46.45 per cent. in the preceding year. The gold production from 1909 to 1911 was as follows:—1909: Ore, 3,515 tons; fine gold, 139 kgs.; fine silver, 25 kgs. 1910: Ore 7,333 tons; fine gold, 347 kgs.; fine silver, 62 kgs. 1911: Ore, 7,132 tons; fine gold, 316 kgs.; fine silver, 50 kgs. In the Muanza district another gold mine entered the producing stage during the year under review, and turned out gold and silver to the value of M.80,000. Of the other gold occurrences in this district, a few have proved unpayable, the others are still in the development stage. The mica mining industry in the

Uluguru hills has continued to develop favourably, and a few mines have been opened. The industry is now entirely in the hands of limited liability companies—viz., the East African Plantation and Mining Company, the Morogoro Mica Mines (formerly A. Trusse), and the German East Africa Plantations and Mining Company. The mica export in 1911 totalled 98,299 kgs., worth M. 348,286, against 106,580 kgs. worth M. 320,720 in 1910, and 94,852 kgs. worth M. 258,799 in 1909. The average price per kg. has, therefore increased in three years from M. 2.73 to M. 3.01 and M. 3.54 respectively. Open pit mining is now in most cases discarded in favour of regular deep level mining. As regards the occurrences of uranium pitchblende in the Uluguru hills, it is not likely that they will ever be the subject of a regular mining industry. The output will probably be limited to casual finds. No prospecting expeditions worth mentioning have taken place in German East Africa, but a government geologist has been appointed. He is specifically charged with the exploration of the country bearing on coal, salt and copper deposits.

* * * *

The City Deep's Financial Position.

A feature of the City Deep report, to the technical details of which we devote space elsewhere in this issue, is the strong financial position disclosed in the directors' statement. The profit amounted to £282,418 15s., to which must be added the difference between sundry revenue and expenditure detailed in the accounts amounting to £7,124 4s. 8d., and £29,738 1s. 8d., the amount unappropriated at the close of the previous year, making a total of £319,281 1s. 4d. This sum was dealt with as follows:—Expended on property under mining rights, shaft sinking and equipment, £23,928 17s. 7d.; Government tax on profits, £26,870 18s.; French Fiscal taxes, £3,230 3s. 1d.; dividend distributed to shareholders, £156,250; balance unappropriated carried to balance sheet and represented by cash and cash assets, less liabilities, £109,001 2s. 8d. During the year £1,300 were charged to vertical shaft sinking, and represent preliminary expenditure in preparing the shaft for sinking operations. On equipment £10,973 were spent. It was estimated that at the end of the year a further sum of just over £18,000 will be required to complete all the authorised work then in hand. The greatest amount is in connection with the installation of a water-borne system of sanitation. Further sums will be required during the ensuing year for the deepening of the eastern or No. 1 vertical shaft, housing of employees and provision for further compound accommodation. The company distributed a substantial sum amongst shareholders last year and now that the action brought by the Federation Company against the City Deep has failed and the labour supply has improved, the outlook is very satisfactory. This view is well expressed by Mr. B. Madew, the Consulting Engineer, who in his report, dated February 3rd, states: "The prospects for the coming year are good. The expectations from the satisfactory reef exposures have been realised by milling results and the ore requirements for crushing, improved profits, and a sufficient supply of native labour."

* * * *

The Battlefields District.

There appears to be a certain revival of interest in the Battlefields district of Mashonaland. A few years ago the Battlefields Company was announcing good returns, but more recently the mine has fallen on evil times. About 18 months ago the directors decided to let the mine on a tributing basis, and Messrs. Minaar and MacAndrew took the proposition over. It is understood that these gentlemen are quite satisfied with the manner in which the mine is developing, and that they are renewing their agreement with the owners. A block of claims about four miles from the Battlefields mine is now being exploited by a London syndicate and the prospects are considered very good. Altogether, then, the outlook in the Battlefields district may be said to be encouraging at present.

TOPICS OF THE WEEK.

THE FUTURE OF THE RAND.

Notable speeches on the position and prospects of the mining industry were evoked from Sir Lionel Phillips and Mr. Chaplin in the course of the Budget debate last week. Sir Lionel very rightly criticised the speech of the Minister of Finance as a bald collection of figures unrelieved by imagination, inspiration or a statesmanlike regard for the future. He proceeded to make good the deficiency by a thoughtful and important address upon the outlook for the chief tax-paying industry of the country, and in this connection his remarks are extraordinarily interesting and of practical value. It is noteworthy, for instance, that *pace* the pessimists, Sir Lionel declared South African as a whole was a highly mineralised country. He firmly believed that neither in this century nor in the next would minerals cease to be worked in South Africa. As far as the Witwatersrand was concerned, he showed that the life of the gold mines depended on a certain number of factors. The first was the question of the temperature of the earth. In this country there was the rare phenomenon that as one proceeded below the surface the temperature increased only one degree Fahr. for every 250 feet descended, whereas one degree to every 65 feet was the normal condition. The consequence was that they could sink into the Witwatersrand mines without experiencing abnormal heat to a much greater depth than they could in the normal parts of the world. The next point was the question of rock pressure, which he admitted embraced a highly technical subject. Up to the present the world's knowledge of mining was confined to some 6,000 feet vertical from the surface. So far as they were advised by the engineers at present, they would be able to sink very much deeper. He thought they could almost safely say that, given as reasonable conditions of working as now existed, the gold-mining industry of the Witwatersrand alone would not be finished in the present century. There were several other factors which he could not take into account in the limited time at his disposal, such as, for instance, that they would be able to get the same amount of gold per ton as they won to-day if they excluded the first 300 feet from the surface. He did not think there were any indications of serious impoverishment as they sank down. Sir Lionel gave an original illustration of the relative quantity of rock crushed to the amount of gold extracted. He said, if they took all the Members of that House and rolled them into one, the total weight would be something like 19,000 lbs. If that bulk contained the same amount of gold as was found in a similar weight of rock in the Rand mines and was extracted from the whole lot, they would have a little nugget of three ounces. It would depend upon working costs, said Sir Lionel, whether in the future reefs less valuable than those at present being mined were worked. On the whole, he thought those reefs would be brought to the paying stage, at, he admitted, "possibly lower wages." He opined that practically unlimited deposits of hematite in the Cape Province would in time give rise to an enormous and important industry, and when those hematite deposits came to be worked, then the iron ore deposits in the Transvaal, which at present were rather discounted on account of the amount of titanium they contained, would acquire an increased value. Mr. Chaplin, who preceded Sir Lionel, dealt ably with the position of the mining industry as regards furnishing revenue to the country. We had got, he said, in this country large deposits of ore. Most of those deposits were of low grade. They had to be worked cheaply, and as regarded deep level mining, it took a considerable number of years before any return could be made. Therefore, the investor on whom we had to rely overseas had to be given some attraction. He showed the fallacy of the statement by the Member for Jeppe, who had said it could hurt no one if the profits tax could be increased by from 5 to 10 per cent. It was forgotten that if they increased the profits tax beyond a certain amount they decreased proportionately the inducement to the investor. The result was that the possibility of starting new mines would be diminished unless it would be possible to pay lower wages, which the Labour Members did not want. Therefore, there would be one of two things—the amount of the wages would be less or new mines could not be started at all. He warned them to see in apportioning taxation that they did not put more on the mining industry than it could bear. What they were entitled to claim was that all the money taken in that way should be properly and economically spent, and that in other things, whenever it was possible to do so, sympathetic treatment should be given to the industry. In many respects the Government realised that and helped the industry, but there were occasions when he thought the importance of a matter was occasionally overlooked. He thought that when a question of policy was considered this point should be borne in mind by the Government more than it had been in the past. It had been said that the profits of the mining industry were not increasing in the same proportion to others. That was quite true, and for that reason the Minister would have to be careful in his estimate of revenue derived from this source. Mr. Chaplin added, however, that the Minister had said that he did not expect any great increase, and he thought that was a right point of view to take. In these two speeches, it seems to us, the Assembly has had the case for the industry put very fairly and fully. We have not attempted to give the arguments adduced by Sir Lionel Phillips to make the Government carry out their obligations in regard to bewaarplaatsen. They are already familiar to all who are interested in the question. Mr. Hull admitted that his investments were all locked up in the industry, but, nevertheless, encouraged the Government in its spoliation hankerings. In a letter to the *Cape Times* on the following day, Mr. H. de V. Steytler shows up the hollowness of Mr. Hull's arguments. The question involves too closely the credit and good name of the Union for us to entertain any doubts of the ultimate decision of the Government. A policy of confiscation would be unthinkable. The speeches made in the course of the Budget debate by mining men in the Assembly show that in this matter they at any rate will make a big effort to save the Government from itself.

THE YEAR WITH RAND COMMERCE.

The annual review of business by the secretary of the Rand Chamber of Commerce is always a document of outstanding value, and that for 1912 is, if anything, of more than usual interest because of the peculiar conditions that prevailed in the year. The Chamber, as is well known, has grown to such an extent of late that its work has been split up among the sections representing the different interests, and, when preparing his report, the secretary, no doubt, enjoys the advice and assistance of the leading people in each section. Thus we quote his remarks on the state of the mining material and machinery trade, knowing full well that they reflect succinctly the opinions of the leading firms engaged in that business. The report tells us that the volume of mining material and machinery business done during the year, as predicted last year, particularly in gold mining machinery, was disappointing; and the outlook for 1913 is not at all promising—nor is any improvement expected until more construction work is taken in hand by the mining groups. The demand for machinery spares, renewals and general supplies remained steady, but the keen competition still prevailing, coupled with the all-round advance in prices of raw and manufactured material in the European markets, reduced local profits in many lines to almost vanishing point. This state of things is regrettable, and a little more unanimity amongst merchants might improve matters in this connection. Tin mines were responsible for a fair amount of business, and it is possible that further plants will be installed in the near future. The same may be said of copper mines. Several orders were placed during the year for winding engines and compressors and also a few turbines, but enquiries were restricted as compared with those in 1911. In respect to timber, we learn from the report that the quantity used by the mines during 1912 was much less than in previous years, and as there is little or no construction work in view the turnover is not likely to increase during the coming months. Stocks having become more or less normal, there has been less tendency to sell at a sacrifice in prices. It was confidently hoped that the very substantial reduction in railage made as from 1st October would bring about a reduction in the prices of the various lines of both deals and log timber. Unfortunately, however, the advance in f.o.b. prices, and particularly the concurrent rise in freights, has far more than counterbalanced the difference in railway rates, and there is no doubt that the present local prices, although they may seem high, will have to be still further advanced if merchants are to get an adequate return on the cost of the incoming cargoes of deals, boards, and logs. It is noteworthy, also, that during 1912 electrical business may be said to have reached a normal state after the somewhat abnormal activity of recent years. The tendency to employ electricity for all kinds of power application has been more marked than ever—but, nevertheless, the total volume of trade has suffered a considerable shrinkage owing to the completion of the greater part of the work of changing over to electric drive on producing gold mines, and also to the fact that comparatively few new mines have been equipped. With respect to town business—that is to say, the supply of domestic appliances and lamps—there are evidences of over-trading and excessive competition. All prices have advanced considerably during the year owing to general advance in the cost of raw materials. In regard to building material and hardware, the trade through the year was, on the whole, better than was anticipated at the beginning of the year. There was a considerable increase in housebuilding, and the demand for building material and hardware was maintained. In groceries and provisions trade generally has been fairly satisfactory during the past year, notwithstanding the unfortunate drought from which the country has been suffering. The report says an encouraging feature is the development of the trade in South African foodstuffs. If the improved standard of these products is maintained, it should not be long before they entirely displace the imported articles, especially in regard to such commodities as butter, cheese, flour, bacon, jams and fruits. The prejudice against South African foodstuffs is disappearing, and in some lines these are now being preferred to the imported article. Under this head the report has the following significant remarks: "It is, however, becoming increasingly difficult to conduct trade on proper lines, for keen competition has maintained, and unfortunately increased, the tendency to give long and indiscriminate credit. Trade would be placed on a much sounder basis if merchants would combine for the purpose of restricting credit accounts within safe and reasonable limits. Business conditions would be considerably improved, also, by altering the practice of paying wages monthly and introducing a general system of weekly or fortnightly payments. There is no doubt also that the continuance of the policy of the Government of maintaining heavy indirect taxation through railway rates, etc., makes household expenses high, and by restricting the purchasing power of the people hinders the development of the country." We must content ourselves with this brief summary of a valuable report. At the annual meeting next week we may expect an elaborate and detailed view of the commercial year, which we trust will not fail to take into account the signs of reviving business.

IRON ORE NEAR PRIESKA.

Ferruginous Beds of the Griqua Town Series—Haematite in the Blink Klip Breccia—The Prospects of an Iron Industry.

The reference in Parliament to the existence of iron in the neighbourhood of Prieska draws attention once again to a district which has been more than once in the public eye as a possible source of mineral wealth. The discovery of diamonds several years ago gave occasion to something of a rush, while later on a good deal of activity was displayed in the development of an interesting but short-lived copper boom. The latter probably received its quietus after an examination of the copper line by Mr. Thomæ, who was sent out from England for the purpose. Nothing appears to have been done with regard to the copper deposits since that time, and although there have been some alleged discoveries of tin in the vicinity to the west, towards Upington, Prieska, as the centre of a potential mining industry, has fallen into disfavour. The announcement that iron ores of good quality have been found to exist in the neighbourhood, especially in view of the source of Parliamentary information, may be accepted with some degree of confidence. The character of the formation, moreover, tends to strengthen the view that profitable deposits of iron occur in the district, for the highly ferruginous nature of the rocks which cover a wide stretch of country between the Orange River and Griquatown, to the north-east, and beyond that towards the north, is one of the first geological features to attract the observation of travellers in that somewhat dreary region.

The Griqua Town Series.

The Transvaal system, which owes its name to the large development of Black Reef, dolomite and Pretoria quartzites and shales which constitute a prominent and widespreading group of rocks in this Province, is well represented in the district under review. Above the limestones and dolomitic limestones of the Campbell Rand, well known to those who journey westwards from Schmidt's Drift on the Vaal River, come the jaspers, cherts, sandstones, quartzites, and other strata of the Griqua Town series, corresponding, as far as the geological horizon is concerned, to the shales and quartzites of the Pretoria series of the Transvaal area. It is this group of strata which is so characteristically permeated with magnetite and hydrated iron oxides, and in which, no doubt, those iron ores are to be found which are now attracting public attention. In discussing a particular sample of the banded black, brown, and white magnetic rock which is so commonly found in the lower group of the Griqua Town series, Dr. Rogers, of the Cape Geological Survey, stated that it contained a large amount of colourless or slightly yellow-stained cherty material, made of very small quartz individuals, which overlapped each other, and were intricately interlocked. Through this ran lines along which the iron ores were concentrated. The lines were the lamination planes of the rock seen in section. The iron existed in two forms, magnetite and an opaque brown ore. It was considered likely that carbonate of iron (siderite) was once a constituent of the rock, and that at least part of the iron ores now forming a considerable portion of the rock were due to an alteration of the iron compounds originally in the deposited sediments. A difficult question that arose was whether all the brown oxide present was a direct result of changes in the carbonate of iron supposed to have existed formerly, or whether some or all was not due to the oxidation and hydration of the magnetite.

Iron Ore Deposits.

Obviously the existence of so large a percentage of iron in the sedimentary strata has been favourable to concentration and to the leaching action of ground water followed by re-deposition of which so many evidences are to be seen in the vicinity of these Griqua Town beds. At Blink Klip Kop, for instance, a hill near Postmasburg, large masses of haematite are found in a cavern which was dug by natives into a limestone breccia at some unknown period. The breccia results from the caving in of a portion of the limestone in which it is found, and the fragments of the original rock are mingled with masses of the haematite, which was evidently the object of the natives' search. It is doubtless from such sources as this that the purest ore bodies will be obtainable. The conditions under which secondary deposits of iron ore are likely to be found in the Prieska country are likely to be very numerous, some of which may be sufficiently promising to warrant mining operations upon a large scale. The difficulty in this connection will probably be not so much the want of suitable ore but the comparatively small demand in South Africa for all the varied manufactured products which alone justify the inaugurating of an enterprise of suitable dimensions.

Modder Deep Levels.

The secretary writes: I am directed to hand you herewith for publication the following particulars of work done on the property of the above-named company, namely:—During the quarter ended 31st March last 3,231 feet were driven, risen or sunk, inclusive of the footage sunk in the incline shaft, but exclusive of the work done in connection with stations, etc. Since the commencement of development work a total of 5,076 feet has been completed. In respect of 400 feet the reef has not been exposed, and 1,089 feet had not been sampled at the end of the quarter. The balance of 3,587 feet assays 6·74 dwts. per ton over 55·2 inches. Work is progressing satisfactorily in all directions.

Guy Fawkes Mine.

An agreement was recently signed between the Mozambique Macequece, Ltd., owners of the claims "Guy Fawkes," in Manicaland, the Company of Moçambique, and Mr. Charles Aubert, whereby the latter secures the right subject to certain conditions to select in one block and prospect and develop and carry on mining operations on forty claims of the "Guy Fawkes," and to use the machinery and plant on the mine for a period of nine months from the date when the main shaft shall be free of water, with the privilege of extending the said period of nine months to twelve on giving the required notice. Furthermore, on Mr. Aubert giving notice to the Mozambique Macequece, Ltd., within this period that he wishes to form a limited liability company in England or abroad for the purpose of acquiring and working the said area, he obtains the right, subject to the consent of the Companhia de Moçambique, to acquire the same and fixed machinery against payment to the Mozambique Macequece, Ltd., of £10,000 and one-tenth of the total registered capital of the new company and one-tenth of any increase on the capital of the new company. On fulfilling the foregoing conditions, Mr. Aubert also has the privilege during a further period of eighteen months of acquiring the remaining rights of the Moçambique Macequece Company against payment of £30,000.

Ceylon Lydenburg.

The following are the particulars of this company's output for the month of March, 1913:—Tons crushed, 649, yielding 352 fine ozs.; estimated value of month's output, £1,452; estimated profit for month, £800.

WEST RAND GEOLOGY.

Some Criticism of Dr. Mellor's Mapping—The Carpenter and Penwith Reefs—A Few Questions and Replies.

It was scarcely to be expected that Dr. Mellor's reading of the geological data of the West Witwatersrand would meet with general approval, or that it would be taken "lying down" by those who have taken up important blocks of claims in that neighbourhood on the strength of carefully elaborated theories of their own. Among those who have objected to the conclusions of the Geological Survey are Mr. E. Kumst, who has long been known as one who has taken a special interest in the country beyond Randfontein, and who has succeeded in obtaining a large amount of financial support in connection with his views. In a recent communication to this journal he propounded a series of questions in reference to Dr. Mellor's mapping of the Western Witwatersrand, and in relation to geological matters generally, which indicate clearly enough that he is not prepared to change the opinions which have at various times been responsible for the Langebrink operations and the West Rand Unified undertaking; not to mention other similar enterprises. Since Dr. Mellor has gone abroad on leave, we must ask Mr. Kumst to accept our explanation of what does not seem altogether clear to him in the maps and diagrams which have been lately published in this journal in order to illustrate the reading to which he raises some objections.

THE WITPOORTJE BREAK.

The first objection is laid against the theory of the Witpoortje fault. Mr. Kumst's view is that there is not really a break such as is said to exist by Dr. Mellor, and, we may add, by most other geologists who have taken the trouble to investigate the matter. His opinion is that there has been an overthrusting of the upper horizons over the lower, in the neighbourhood of Krugersdorp. The only grounds for coming to a conclusion of this kind are found in the very disturbed line of country which lies adjacent to the Rietfontein fault west of Krugersdorp and near the south-eastern corner of Sterkfontein. Mr. Kumst makes the Coronation reef disappear beneath the Government reef horizon at the first of these points, to reappear again at the other. The Geological Survey mapping makes it evident that although there is an interruption in each of these places, the whole series below the Government reef is carried round the curve, and roughly conformable, as to its outcrops, with this overlying group. There is no evidence whatever of overthrusting from the south, and in order to upset this view it will be necessary to find errors in Dr. Mellor's mapping of the leading beds; the Hospital Hill quartzites, for instance. The theory advanced by Mr. Kumst was originally intended, we believe, to justify the statement that the Carpenter's series, which outcrops on the western side of Waterval, was the Main Reef series of the Central Rand. More recently it has been maintained by him that the Penwith reefs represent the Main Reef series. The same theory can scarcely support both statements. With regard to the basin-like structure of the Government Reef series north of Krugersdorp, it may be pointed out that the Rietfontein fault is not said to be altogether responsible for this condition of things; there has been severe local folding, complicated by a minor fault which is shown in our diagram of the issue of the 1st March last.

THE GOVERNMENT REEF.

Mr. Kumst does not agree with the statement that the Government Reef strikes north and south through the middle of Waterval. The map authorised by Dr. Mellor shows that it does, although the line of strike is not continuous on account of the interference of the overlying Black Reef series. It is shown on the map in three portions; the first in the neighbourhood of the shafts put down to the north-west of the homestead, the dumps of which are visible along the sky line from the Penwith; the second, across the Penwith claims; and the third across the north-west corner of Randfontein. In reply to our queries in regard to this matter Dr. Mellor asserted definitely that the reefs dipping west on the Penwith ground were an extension of the Government Reef series. The two broad bands of quartzites—next below the Government Reef—with their accompanying shales are those which intervene above the Carpenter line of reefs and are shown in a section by Mr. Kumst in our issue of the 4th February, 1911. A notable feature of the West Rand Unified—or Penwith—reefs, is the remarkably clean contact between the lowermost pebble bed and the underlying shale; a feature which is characteristic of no other series of reefs on the Western Rand.

THE CARPENTER LINE.

The Carpenter series of reefs is not indicated in our map, but the inlier in which they are to be found on the western side of Waterval is doubtless that circular space which appears to the left of the West Rand fault of Dr. Mellor. Just below it, in another inlier, is seen the Government Reef series, which, according to the view of this authority, is duplicated by the fault. The Carpenter series would be, therefore, on the Coronation line, and Mr. Kumst's red bar would be the so-called red bar of Kassner, which lies a little below the Coronation Reef on Witpoortje. In Dr. Mellor's earlier sections it is referred to as "j^3." This so-called red bar is to be seen at the same horizon in the south-eastern corner of Sterkfontein, and it was doubtless this feature of the series which led to the conclusion that the Carpenter line was an extension of the Main Reef series. Mr. Kumst was not alone in this view, for in an old map of Mr. David Draper, published since the war, the Main Reef series is indicated as running a little to the west of the Government Reef basin on Paardeplaats. The map referred to, in this respect, however, does not represent Mr. Draper's later opinions.

SOME GEOLOGICAL QUESTIONS.

The following questions asked by Mr. Kumst do not appear to have a definite bearing upon Dr. Mellor's mapping, but since any geologist who may be interested in the matter has been invited to reply to them, we are presumably not prohibited from making the attempt:—(1) Why are the dolomite and Black Reef series conformable to each other and unconformable to the underlying Rand strata? (2) Why are the dolomite and Black Reef series conformable to the old granite when found in contact with the same? (3) Why has every series of reefs its own separate dykes, faults and breaks, which are in no way connected with the over or underlying series of reefs? (4) By what forces were our different Rand beds pushed with an unconformity towards the graniteboss? Replies: (1) Because the dolomite and Black Reef are of much later age and were laid down after considerable earth movements had intervened. (2) They are not geologically conformable. (3) In all faulting movements which have affected large areas there have been small displacements of limited extent; these are doubtless what Mr. Kumst refers to. Longitudinal faults may come in the same category, as far as surface appearances are concerned, and also longitudinal dykes, but there is no evidence to support the view that these are unconnected with underlying reefs at a lower horizon. Obviously nothing can be said about the denuded portions of overlying reefs. (4) The generally accepted opinion is that the graniteboss was thrust against the Rand beds. The meaning of the term "unconformity" is not quite intelligible in this question.

THE NEW MODDERFONTEIN AND ITS BRILLIANT FUTURE.

Likelihood of the Property Becoming the World's Leading Gold Mine—The Circular Shaft—Some Further Considerations.

In our last issue we presented a detailed account of the New Modderfontein Company's circular shaft, and of the method of sinking adopted, and we then stated the prime reasons which induced the technical directors of the Central Mining and Investment Corporation to decide in favour of a round rather than rectangular pit. The depth of this shaft is 2,158 feet; sinking was carried out in it at the rate of 100 feet per month, and the total cost of sinking and bricking worked out at £22 1s. 7d. per foot. These are thoroughly satisfactory records. Having regard to the capacity of the shaft (it has been decided to raise a load of six tons per trip), the decision to sink a circular pit would seem to be quite justified on the grounds of speed and cost of sinking alone. But over and above these considerations substantial advantages are claimed for the circular shaft—notably in regard to ventilation.

Effect on Rand Sinking Practice.

Taking all these matters into account, the question may fairly be asked: " Is it likely that future Rand shafts will be of circular type?" As a matter of fact, it is unlikely that more than a very small and limited number of new deeper level shafts will be sunk on the Witwatersrand in the future. In the Further East Rand area a certain number of new verticals will be required in order to open up the areas lying to the east of the present sphere of activities, but these are likely to be few in number, and, in so far as the Central Rand is concerned, there is, as we have remarked on several previous occasions, not much likelihood of other deep shafts being called for. However, it must be admitted that taking the Rand as a whole the last few shafts have certainly not yet been sunk, and since the management of the New Modderfontein Company has been able to show such excellent results in the circular pit it may at least be assumed that before the type of any new shafts finally is decided on the advantages of the circular pit as put down at the New Modderfontein will have to be very thoroughly analysed.

Revival of Controversy Likely.

The publication of statistics as to cost and rate of sinking contained in our last issue will very likely be the signal for a revival of the round versus rectangular pit controversy. Such a revival, in view of the data now to hand regarding the New Modder shaft, should be of the greatest interest, and the opinions and experiences of the champions of each type should be of immense technical value. In this connection it may be recalled that the New Modderfontein circular shaft is in size and capacity the equivalent of a seven compartment rectangular, and we should be much surprised to learn of a rectangular shaft of such size which has been sunk to a depth of over 2,000 feet for a fraction over £22 per foot. There appears to be something in the nature of a prejudice against circular shafts in metalliferous mining areas which is not altogether easy to understand. In parts of the world other than South Africa, round shafts have been much favoured, more particularly on the coal and potash fields of the Continent. In Germany the discovery of the great potash salt fields has resulted in the establishment of a new industry, and a number of circular shafts have been sunk. Some of these have been put down under great difficulties, but so far as we know there have been no failures. As an example of the capacity of one of these Continental shafts, the Zeche Prosper pit may be mentioned. In two shifts of eight hours, one shift hauling from 2,420 feet and one from 1,220 feet, 3,600 tons can be hoisted. This would amount in a month of 26 working days to 93,600 tons, working only 16 hours out of the 24.

Other Circular Pits on the Rand.

On the Witwatersrand, however, there are only four circular shafts. Previous to the war the house of Barnato favoured the sinking of round pits. At the Langlaagte Royal, New Unified and New Primrose, three main circular shafts were put down by Mr. L. Hamilton, who considered them preferable to rectangular shafts on the score of greater cheapness (both in sinking and timbering and strength and as affording better means of ventilation). The New Primrose main, which was sunk to 400 feet, was 11 feet in diameter and had an excavation area of 95 square feet. In had two compartments. One of these was for Cornish pumps, etc., and the other compartment contained one double and one single cage (the large cage with 40lb. rail guides on the pump dividers and the small cage with the three rope guides). It was calculated that this shaft was equal to a three compartment rectangular shaft. At the Langlaagte Royal the shaft was 15 feet in diameter, with an excavation area of 175 square feet. It was designed to go to a depth of 900 feet, and we believe is now being used as a ventilating shaft by the Crown Mines, Ltd. In addition to this, the Western Rand Estates Company was for some time engaged in sinking a circular shaft on Gemsbokfontein.

A Glimpse of the Future.

But to return to the New Modderfontein. The enormous potentiality of this great mine, which is in extent 2·2 miles from east to west and 1·6 miles from north to south, has for long been recognised, and that it is capable of earning vastly larger profits than are at present being earned is common knowledge. A glance at a map of the property showing the enormous extent of practically untouched ground in the eastern section, which will be exploited from the new circular and No. 12 incline shafts readily convinces one that the mine is at present being operated on a much smaller basis than actually is warranted. At the end of last June the ore reserves amounted to over 4,000,000 tons, or approximately seven years ahead of milling requirements, and about the middle of this year it is expected that connection between the new circular shaft and the No. 12 incline will be completed. The scope for rapid development in this section of the property obviously will then be enormous. It may be recalled that at the meeting held in November last, Mr. R. W. Schumacher, who presided, declared: " We have been doing a great deal of preparatory work that will enable us to handle ore cheaply over long distances underground, and render our whole system of transport thoroughly efficient. We estimate that in six months' time we shall, given the necessary labour, be in a position to break, handle and hoist at least 20,000 tons per month more than our present mill can take. The work has cost us a lot of money; we have done what many mines could not afford to do, and we shall soon have our reward." Another very interesting and highly important statement was made by Mr. Schumacher the other night at a staff dinner of the company, when he indicated the probability of the New Modderfontein becoming the leading gold mine of the world. The commendable desire to ascertain the nature and value of the ground in the eastern section of the property, coupled, too, no doubt with the unsettled state of affairs in Europe, have naturally induced the directors to pursue a careful and cautious policy of late. But in any case we feel certain that the New Modderfontein is now on the eve of a period of expansion that will carry it almost to the top, if not right to the top, of the list of the world's gold mines.

THE YEAR WITH THE ROBINSON.

Largest Gold Dividend Payer Issues Satisfactory Reports.

The consulting engineer of the Robinson, which, as is well known, has distributed more money amongst shareholders in dividends than any other gold mine in the world, writes:—

In forwarding you my report on the operations of your mine for the year ended December 31st, 1912, I beg to call your attention to the following points. The past year has continued the experience of 1911, in that the mine, at one time fully supplied with the best quality of labour, has, together with other similarly placed mines, experienced a pronounced shortage. This has been modified as much as possible by employing a large number of the more expensive and less reliable coloured labourer, but not without showing a reduction of some 37,000 tons in the ore mined, and 15,400 tons in the ore milled. The grade recovered shows a reduction of 1s. 9d. per ton, and the costs, as a consequence both of the labour shortage and of the increasing age of your mine, show an increase of 1s. per ton. The working profit earned at £808,761 is, in consequence of these facts, considerably below that earned during previous years. A further profit of £8,515 was made from the treatment of accumulated slimes. Capital expenditure was reduced to a minimum amounting in balance to but £2,918, and since the end of the year the last remaining Capital vote has heen closed, and no more expenditure on capital account is contemplated. The development footage accomplished amounted to 5,823 feet, a reduction of about 40 per cent. below the previous year. This is due to the development of the ground lately purchased from the Government being practically completed. There is now no urgency with the work remaining, and as a consequence development footage will show a considerable further falling off for the future. No shaft sinking was done. The reef disclosures for the year have been satisfactory, and especially so in the South Reef; owing to Leader values not always being fully exposed there is an apparent reduction in value on this reef, but the stopes may be relied upon to give better values than the drives bave so far shown. The ore reserves have been re-estimated as at December 31st, 1912, and now amount to the following:—

	Tons.	Value. Dwts.	Value. s.	Value. d.	Stope Width. Ins.
Leader	680,200	10.5	44	1	83
South Reef	450,400	11.6	48	8	61
Total Leader and South Reef block ground	1,130,600	11.0	46	2	
Estimated tonnage as recoverable from old workings, stope, and shaft pillars on these reefs	242,500				
Total	1,373,100				

The whole of the above tonnage is available for stoping. Compared with last year the block ground shows a reduction of 91,000 tons, due principally to the excess of ore mined over that developed; the values also show a reduction of .4 of a dwt. In addition to the above, the re-estimate of the Main Reef available gives a tonnage of 1,160,800 tons of payable ore at 4.3 dwts. (18s. 1d.) per ton on this reef, of which 118,500 tons are in the form of packs of broken ore used as temporary supports in the workings. Sands filling, you will notice from your Manager's report, has been carried on on a larger scale than during 1911, but was reduced towards the end of the year, due both to the completion of the filling of certain large areas, and also owing to the shortage of labour at times, which necessitated the concentration of such labour as was available on the winning of ore for the mill. The increasing importance which the payable Main Reef bears to the remaining reserves on the two richer reefs is clearly indicated in last year's and this year's reports. As the coming year promises a greatly improved labour position, it should be possible to mine the tonnage required to keep the reduction works more fully supplied, by mining a proportionately larger amount of ore from the Main Reef

The manager, Mr. Palmer Carter, reports that:—

The working expenditure and revenue account stood thus:—

	£	s.	d.	Per Ton based on Tonnage Milled. £	s.	d.
Total revenue	£1,260,529	15	7	£2	3	8
Total working costs	451,769	3	8	0	15	8
Working profit	£808,760	11	11	£1	8	0

Development.—The footage for the year has decreased by 3,947 feet; it is expected that all development will be finished during the year 1913. *Main Reef.*—The percentage of Main Reef mined during the year, viz., 25 per cent., shows a decrease of 8 per cent. when compared with the previous year; this was due to the continued shortage of labour. *Sands Filling.*—The tonnage of sand lowered into your mine was 230,950 tons, and this figure might have been greatly increased but for the shortage of labour experienced at certain times during the year.

Brakpan Mines.

The following is the output of the Brakpan Mines, Ltd., for the month of March, 1913:—Stamps working, 160; running time, 28 days; ore crushed, 55,274 tons; tube mills working, 8; ore hoisted, 63,784 tons; ore from dump, 935 tons; waste sorted, 18·14 per cent.; fine gold declared, 19,105 ozs.; value declared, £80,465, equal to 29s. 1d. per ton milled; working costs, £50,349, equal to 18s. 2d. per ton milled; working profit, £30,116, equal to 10s. 11d. per ton milled.

Luipaardsvlei Estate.

The following is the result of this company's operations for the month ended 31st March, 1913:—60 stamps ran 27·911 days; crushed 16,670 tons of ore, yielding 2,010 ozs. fine gold; three tube mills ran 28·023 days, yielding 698 ozs. fine gold; 11,820 tons sands treated, yielded 1,322 ozs. fine gold; 4,850 tons slimes treated, yielded 387 ozs. fine gold; profit from operations, £2,401; sundry revenue, £668; working costs, 19s. 4·774d. per ton crushed.

Roberts Victor.

The following was the result of the working of the Roberts Victor diamond mine for the month of March, 1913: 13,674 loads washed, yielding 3,914¼ carats. Reduced quantity washed owing to rain.

Glynn's Lydenburg.

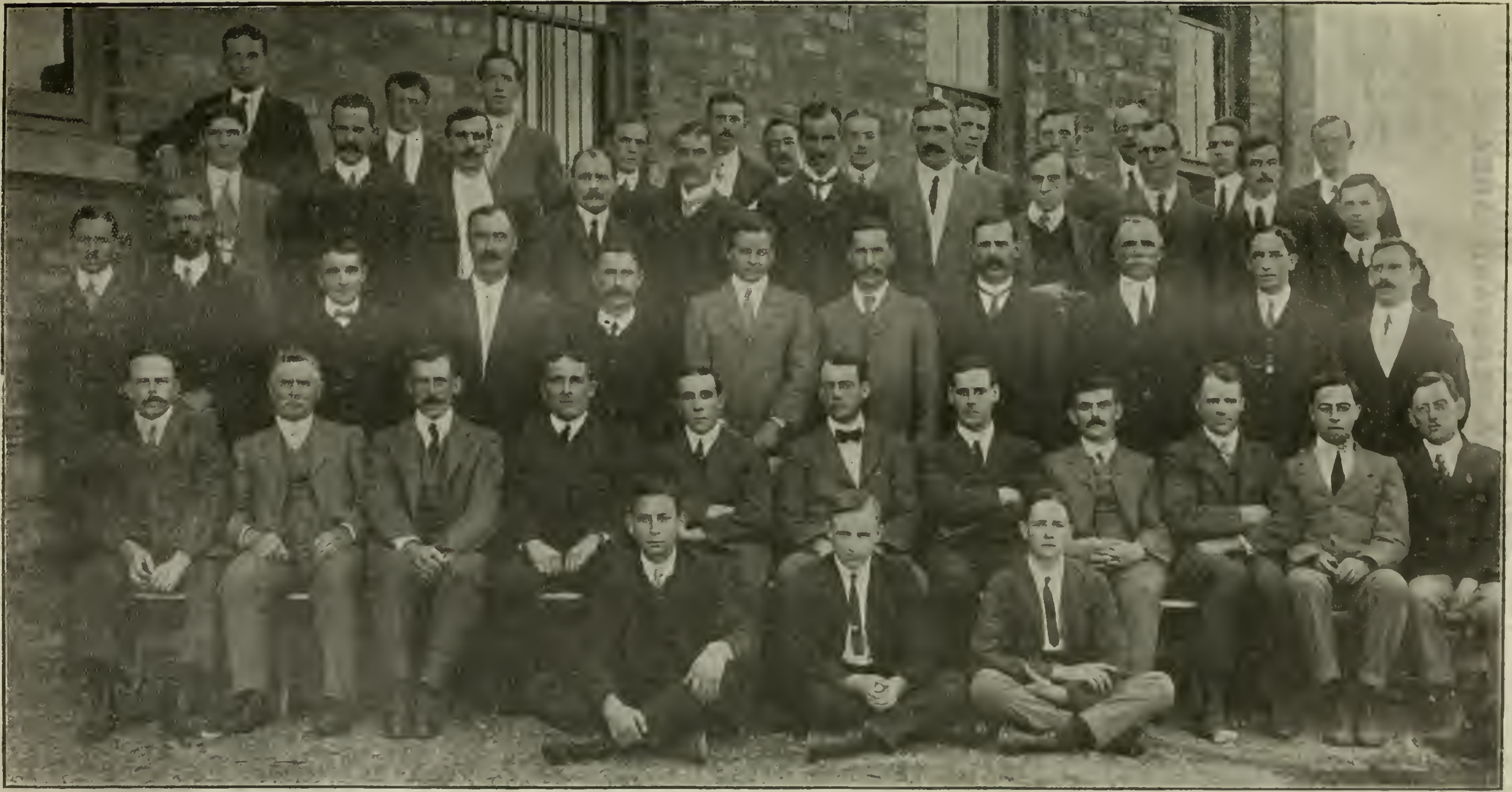
The revenue of the Glynn's Lydenburg for the last quarter amounted to £21,146, or 42s. 11·3d. per ton, from 9,847 tons crushed; cost, £9,940, or 20s. 2·2d. per ton; profit, £11,206, or 22s. 9d. per ton; capital expenditure, £262 3s. 5d.; total yield, 5,062·356 fine ounces; total yield per ton, 10·282 dwts.; development work, 2,434 feet; distance exposed, 430 feet; width, 8 inches; assay value, 41s. 6·9d. Operations during the quarter were considerably hampered through frequent stoppages at the power station, caused by lightning and flood. The consequent loss of profit is covered by insurance.

The following are the particulars of this company's output for the month of March, 1913:—Tons crushed, 3,689, yielding 1,941 fine ozs.; estimated value of month's output, £7,950; estimated profit for the month, £4,285.

Rooiberg Minerals Development Co.

The following are particulars in regard to the operations on this company's property for the month of March, 1913: Stamps, 10; days run, 30·087; tons milled, 3,113 short tons; concentrates, 100 long tons; average assay value metallic tin, 69·35 per cent.; estimated profit, £6,359 17s. 5d.; adjustments in respect of previous shipments due to fluctuations in the price of tin to be added, £304 18s. 6d.; profit for month, £6,664 15s. 11d.; net capital expenditure, £360 1s. 9d. The concentrates in reserve at the 31st March, 1913, amounted to 17·33 long tons (2,240 lbs.) of the net value of £1,616. £2,451 13s. 10d. has been included in working costs for the month in respect of shaft sinking, exploration and mine development. Tonnage milled includes 1,110 short tons sands re-treated.

THE MANAGER AND STAFF OF THE KNIGHT CENTRAL, LTD.



Front Row (left to right): J. Berman, clerk; F. Silson, assistant surveyor; A. E. Trollip, store assistant.

First Row: F. C. Escott, chief assayer; E. Trollip, compound manager; A. P. Dawe, cyanide manager; J. H. Julyan, mine captain; C. Julyan, acting mine secretary; F. G. A. Roberts, general manager; H. Newbery, engineer; A. Whitford, mine captain; J. W. Travers, mill manager; R. R. Mitchell, chief surveyor; G. S. Armstrong, storekeeper.

Second Row: P. V. de la Cour, shiftboss; J. Sinclair, manager's secretary F. Whitford, shiftboss; J. Bell, foreman smith; E. McChesney, outside foreman; P. R. Levick, engineer's clerk; T. R. Laing, foreman fitter; J. H. Eathorne, foreman carpenter; R. Hall, foreman mason; R. Wyper, European timekeeper; E. H. Legg, assistant hospital superintendent.

Third Row: M. T. Cook, assistant sampler; L. G. Thompson, assistant sampler; G. W. Anderson, compound clerk; W. R. Hill, chief sampler; R. G. Williams, shiftboss; R. C. Wyper, assistant assayer; A. Whitaker, shiftboss; J. Aitken, shiftboss; T. A. Forrest, foreman timberman; S. M. Pawson, cyanide shiftsman; W. M. Hewitt, compound clerk; R. Pearson, caretaker; G. R. Heywood, assistant surveyor; W. MacLaughlin, assistant compound manager; J. L. Turnbull, time clerk; A. M. Powell, foreman electrician; H. Hancock, assistant storekeeper; W. A. C. Bailey, native timekeeper; C. Sleight, watchman; W. M. Campbell, assistant assayer; A. E. Walker, time clerk; H. Johnson, time clerk; J. D. Hauptfleisch, time clerk.

MINE SAMPLING AND ORE VALUATION, WITH SPECIAL REFERENCE TO THE WITWATERSRAND AREA.—I.

[By Arthur S. Lejeune.]

Chapter I.—Preliminary.

In mine sampling, as in all other classes of work, special tools are required. The tools required by the mine sampler are, however, few in number and inexpensive. They may conveniently be classed for discussion as follows:—

(a) *Hammers.*—There is more or less a unanimity of opinion that the best weight of hammer to use, at any rate on reef of banket hardness, is one of 4 lbs. This gives sufficient weight to split pieces off the reefs and at the same time is not too heavy to be convenient to use.

(b) *Chisels.*—When we come to these tools we are immediately confronted by the diversity of opinion that exists in regard to the best shaped chisel to use. Some men swear by a diamond-pointed chisel, and other men, equally experienced, say there is nothing to equal a flat-edged tool. The author, for a considerable time, used a chisel bent at the point, as shown in fig. 1. The advantage claimed for this form of chisel is shown very clearly in sampling reefs on the hanging wall. In this instance, by virtue of the bent point, the sampler's hand does not come in contact with the rock surface. Another advantage afforded by this chisel is that the force of the blow is resolved into two vectors, one along the shaft of the chisel and one at right angles to it, thus producing a strong lever action tending to break the sample away from the face. A disadvantage put forward is, that the fact of the point being bent renders the risk of fracture of the steel at the flexure a very great one. In this connection it is worthy of note that, during a period of eighteen months, the author has not found a single chisel broken at this point.

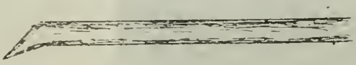


Fig. 1.

(c) *Sacks* for holding the samples should be of strong canvas and should be sufficiently large to hold at least six pounds of the material being sampled.

In addition, the sampler will require the following:—(1) A bucket for holding water; (2) a syringe for spraying the face of the working place; (3) a metallic tape; (4) a two-foot clinometer rule; (5) chalk in large lumps.

Chapter II.—The Taking of the Sample.

As, in most cases, the sampling returns are used as a check against the gold recovery, it follows that the samples must be very carefully taken. The most expedient method of discussing sample taking is to divide the subject into three classes, viz.:—(a) Sampling in stopes; (b) sampling in raises and winzes; (c) sampling in crosscut raises and winzes.

(a) *Sampling in Stopes.*—As stopes, in nearly every case, are sampled once every month, it follows that not so many samples are required to arrive at a correct value as would be the case in the valuation of development faces. Consequently, we find that sections are taken in stopes at much larger distances apart than in the case of development. Judging by general practice it would appear that an interval of twenty feet between consecutive sections is the favourite one. The method of procedure then is as follows:—The first section is taken at the top of the stope immediately below the drive pillar, and the actual sampling is performed as follows: The face is first well washed down by means of the syringe, for two reasons—(a) To clear the face so that the sampler may see clearly which is reef and which is waste; (b) to rid the surface to be sampled of any rich dust which may have been blown against it, and which if left on might give a totally erroneous assay result. (2) Next the bands of reef are clearly marked with the chalk and each band is sampled separately. It is well to observe here that if any one band is very wide it should be split up and taken as two or more samples. This applies particularly if the band is very rich. (3) When this is done the sampler sets to work to chip off his sample, taking great care to get as far as possible an equal quantity from every part of the rectangle chalked out. (4) When the sample is chipped off the thickness of reef included in each sample is measured in inches. Some men prefer to measure the width before chipping the sample off, but, in the opinion of the author, this is very bad practice for the reason that it is more likely that in the process of chipping the width may quite easily be exceeded by the chisel or may be less than the measured width. (5) When all the bands of reef and the interbedded bands of waste have been measured the stoping width must be determined. The measurement of the stope width should be made at least five feet back from the face, as the width of the stope *at* the face is always less than the normal width. (6) The results must then be booked. A convenient form of booking is shown below. This shows a group of four sections showing the relation of the various bands of reef in the different sections to each other:—

Method of booking:—

The All Day Gold Mining Company, Limited.

Stope No. 11 West M.R. No. 2 East face.

Date: 11th February, 1913.

Sample No.	Position of Section. feet.	Reef. ins.	Waste. ins.	Stope width. ins.	Remarks.
			12		
1	10 feet down From drive	3			Hanging wall good.
			15		
2		18		70	Fair looking.
			4		
3		10			Scattered pebbles.
			8		
			21		
4	30ft. down	8			Good looking.
			10		
5		16		62	Fair.
			7		
					Bottom band in Footwall.
			10		
6	50ft. down	7			Good looking.
			12		
7		12			= 2 and 5.
8		14			
			5		
9		8		72	Footwall band.
			4		
10	70ft. down	10			Fair = 7 and 8.
			6		
11		11		48	Footwall band.
			21		

It will be seen from the above that in section 2 the footwall band has not been mined, while in section 4 the whole of the top band and part of the middle one are in the hanging. The fact that there is more reef in the hanging or foot is indicated by means of the wavy line, as in sections 2 and 4.

(To be continued.)

THE CROWN MINES TO-DAY.

Extracts from Annual Reports for 1912—Ore Reserves, 10,607,761 Tons.

From practically every point of view the Crown Mines must to-day be regarded as the leading mining proposition of the world, and the reports of the directors, of the consulting engineer, and of the general manager, contain such a wealth of valuable statistical data that in a somewhat necessarily brief review of the affairs of this great company it is difficult to condense the informative documents before us. Perhaps the outstanding feature of the report is the announcement with regard to ore reserves. Under this head, Mr. H. Stuart Martin, the consulting engineer, writes:—

> The payable ore reserve at 31st December, 1912, was estimated as follows:—Main Reef Leader, 5,505,234 tons, 7.44 dwts., 31s. 3d. value; South Reef, 5,102,437 tons, 6.70 dwts. 28s. 2d. value. Total and average, 10,607,671 tons, 7.09 dwts. 29s. 9d. value. This represents an increase of 483,599 tons, about 6 per cent. more than would be expected from the Company's returns during the year. This discrepancy is largely due to the fact that owing to the reduction in working costs certain blocks previously estimated as unpayable are now brought within the payable limit. Also in certain South Reef areas between Nos. 1 and 2 shafts, previously regarded as unpayable, a payable leader has been found some distance under the main body of reef, thus enabling these blocks to be transferred to the payable ore reserve. The above ore reserve may be analysed as follows:—1. Tonnage completely blocked out for stoping, 8,957,896 tons, 7.2 dwts. 30s. 3d. value. 2. Tonnage fully valued but not quite completely blocked out for stoping, 1,090,808 tons, 5.5 dwts. 23s. 1d. value. Total, 10,048,704 tons, 7.0 dwts. 29s. 5d. value. 3. Tonnage in shaft and boundary pillars, 558,967 tons, 8.0 dwts. 33s. 7d. value. Total ore reserve, 10,607,671 tons, 7.1 dwts. 29s. 10d. value. In addition, there remains above the 13th level a tonnage of approximately 988,000 tons which has not been included in the ore reserve as it cannot at present be valued. This tonnage will require little expenditure for development. The widths on which the above tonnages have been calculated are 62 inches in the Main Reef Leader and 63 inches in the South Reef.

His report further states that the year's profit was £1,314,247, representing an increase over the previous year's results of £13,140, the profit per ton being 13s. 8d. as against 15s. 8d. The increase in the total profit can be accounted for largely by an increase in the ore milled of 302,200 tons, and a saving in costs of 1s. per ton. In concluding his statement, Mr. Martin writes:—

> The expenditure on capital account during the year amounted to £238,727 12s. 1d. Practically the only items remaining uncompleted at the end of the year were the erection of the 3rd winder at No. 5 shaft, and the 3rd-stage winding equipment at No. 7 shaft. The difficult problem of bringing this mine to its present capacity has now been successfully overcome. The general surface and underground arrangements are so linked up that the whole of the amalgamated properties are now worked as one unit. Both winding shafts are common to the main underground haulages, and the ore hoisted can be transported to and treated by any one of the three mills and reduction works. The success in bringing this huge undertaking to its present satisfactory state can only be attributed to the organising ability of your General Manager, Mr. R. C. Warriner, and the loyal co-operation of his staff. The prospects of the new year are promising, and, provided the present labour force can be maintained, the profits earned for the current year should show a material improvement as compared with the year under review.

Mr. Warriner states that the total revenue was £3,071,217, or 32s. per ton. Working costs absorbed a million and three-quarters, or 18s. 4d. per ton. On the subject of main haulage levels, Mr. Warriner writes:—

> The 13th haulage level is now completely equipped, and in operation between Nos. 1 and 7 shafts. All ore which would formerly have been hoisted through Nos. 1, 2, 3 and 5 shafts is now being transported by electric haulage to No. 5, and hoisted through that shaft, thus concentrating the work of hoisting to practically two shafts, Nos 5 and 7. A small tonnage from the upper levels is still being pulled through No. 4 shaft, but the bulk of the rock from these areas is also conveyed, by means of ore passes, to No. 5. The continuation of the 13th level west of No. 7 shaft progressed 981 feet during the year, to a point 1,563 feet west of that shaft, leaving approximately 4,500 feet still to be driven before the western boundary of the property will be reached. A start was also made during the year on the 16th haulage level.

PROGRESS AT THE KNIGHT CENTRAL.

Effect of Simmer Dyke on the Reef Position.

This year's Knight Central report contains a plan and section which show very clearly the influence of the Simmer dyke on the reef position and the extra development work necessary to open up the displaced portion. In regard to this Mr. S. C. Thomson, the consulting engineer, writes:—"Although it was known that this dyke must sooner or later cross the property, the data available from neighbouring properties and from surface trenching carried out some years ago did not indicate its position to be so far north as now proved. It is, however, just as well that it has been encountered at this time, as the surface winding plants had about reached their limits of efficiency, and subsidiary hoists would shortly have been required in any case. Notwithstanding the delay in development occasioned by intersecting the dyke, it is of interest to note that the ore reserves have not been reduced, being 647,000 tons, valued at 6·1 dwts. over a stoping width of 62·5 inches, as compared with 644,300 tons, at 6·04 dwts. over 60·56 inches at the end of the previous year. The total profit for the past year was £54,427, as compared with £70,817 for 1911. This is to a large extent accounted for by shortage of native labour, for whereas the average monthly labour strength in 1911 was 2,594 that for the past year was 2,159, which more than accounts for the difference in tonnage treated. The actual value of the yield per ton, with satisfactory extraction in both years, was slightly higher during the year under review, and the higher costs, approximately 9d. per ton, are accounted for by the lower tonnage treated and the increased expenditure on development. The present ore reserves with the tonnage remaining to be developed north of the dyke should be sufficient to allow milling operations to proceed without curtailment while additional ore is being developed south of the dyke. The labour supply under the new organisation should be better than during the past year, and working profits should be equal to those for 1912, in spite of extra cost of development south of the dyke. The equipment of the subsidiary inclines will entail considerable expenditure on capital account, and, naturally, the future of the mine will largely depend upon the value of the ore opened up by development south of the dyke." The manager of the property, Mr. F. G. A. Roberts, in his annual report, writes that the revenue from gold was £333,877, or 23s. 3·59d. per ton. Working costs absorbed £279,450, or 19s. 6·01d., and the working profit was £54,427, or 3s. 9·58d. Since milling operations were commenced in 1909, and up to the end of last year, the value of the gold produced was £1,304,158.

Transvaal G M. Estates

The following particulars are in respect of this company's output for the month of March, 1913:—Central Mines: Tons crushed, 12,500, yielding 8,388·933 fine ozs. Elandsdrift Mine: Tons crushed, 680, yielding 845·171 fine ozs. Vaalhoek Mine: Tons crushed, 1,430, yielding 565·424 fine ozs. Estimated value of month's output, £41,151; estimated profit for the month, £25,298.

CITY DEEP.

All-round Improvements—Increased Profits and Larger Ore Reserves.

Mr. B. Madew, consulting engineer of the City Deep Company, in his report for last year, shows that from every point of view 1912 was a satisfactory period in the history of the company. He writes:—

The following are the more important features of the year's work, as compared with the previous period:—

	Year ending Dec. 31, 1911.	Year ending Dec. 31, 1911.
Tons milled	349,713	479,630
Yield per ton milled	30s. 9d.	35s. 6d.
Working costs per ton milled	23s. 3d.	23s. 9d.
Working profit per ton milled	7s. 6d.	11s. 9d.
Working profit, including profit from accumulations	£134,886	£292,654
Payable ore reserves at end of year	2,078,805 tons. at 8.1 dwts.	2,123,650 tons. at 8.7 dwts.

Of the tonnage milled during the year 424,363 tons at an average yield of 38s. 3d. per ton were hoisted from the mine, as against 260,661 tons at 36s. 3d. for the previous year. The balance of the tonnage was derived from the surface dump, which continued to supply ore to the mill in diminishing quantities up to the final contribution at the beginning of August. The working profit, £292,654, is made up of £268,072 from mine rock, £14,347 from the dump, and £10,235 from the treatment of accumulations, the corresponding figures for the year 1911 being £105,928, £24,986, and £3,972 respectively. The costs are high, due to the tonnage treated being considerably below the figure for which the mine and plant have been laid out, and to the large amount charged for development redemption, equivalent, during the last half of the year, to 3s. 9d. per ton milled. While the results of the year's operations show a pleasing advance on the previous period, they are still not representative of the capabilities of the mine. The underground efficiencies, which for some time were disappointing, have been satisfactorily improved, stope faces have been rapidly opened up, and the only reason why the mill was not supplied with a larger tonnage during the latter part of the year was the inadequate number of natives in the service of the Company. The number of natives has been insufficient to continue the necessary stoping and development, and during the last quarter it was only possible to maintain an average of 41,000 tons per month by removing labour from development. Notwithstanding this curtailment of development, the footage accomplished exceeded that of the previous year by 6,655 feet, and the total ore developed was 493,445 tons, of which 462,991 tons on the Main Reef Leader, or 93.8 per cent., were payable of an average value of 11.1 dwts. A gratifying feature of the year has been the continuance of high grade Main Reef Leader exposures throughout the mine, the average of all disclosures on this reef for the twelve months being 21 inches at 24.3 dwts., or 510 inch-dwts. over the footage sampled of 10,470 feet. Work in connection with opening up the area North of the present development was proceeded with. The 2nd Level crosscut North intersected the Main Reef Leader shortly after the close of the year, at a distance of 1,105 feet from No. 2 shaft, the ore exposed being of good grade, as will be seen in the manager's report. Another cross-cut North was started in October from the same shaft on the 4th Level, and is now being advanced from both ends. The East Incline at No. 2 shaft was sunk to below the 10th Level, and development work on this level will be actively undertaken during the current year. The payable ore reserves at 31st December, 1912, were estimated as follows:—Main Reef Leader, 2,108,000 tons; value per ton, 8.7 dwts. or 36s. 6d.; South Reef, 15,650 tons; value per ton, 4.8 dwts. or 20s. 2d.; total, 2,123,650 tons; value per ton, 8.7 dwts. or 36s. 6d. The above reserves may be classified as below:—(1) Ore immediately available for stoping, 1,750,800 tons; value per ton, 8.8 dwts. or 37s.; (2) ore valued, which will be rendered available for stoping by current development, 163,740 tons; value per ton, 7.2 dwts. or 30s. 3d.; (3) ore contained in shaft and safety pillars, 209,110 tons; value per ton, 8.6 dwts. or 36s. 1d.; total, 2,123,650 tons; value per ton, 8.7 dwts. or 36s. 6d. Compared with the previous year, there is an increase of 44,845 tons, while the grade has improved by .6 dwt. per ton. The increased tonnage is satisfactory in view of the curtailment of development, as referred to above, and the higher grade is attributable to the good values of ore exposed during the year in the Main Reef Leader. The estimated stoping width of the payable Main Reef Leader ore reserves is 58 inches, and of the South Reef 55 inches. The total unpayable tonnage developed in the mine since the commencement of mining operations amounts to 262,200 tons, of 3.1 dwts. average value, of which the Main Reef Leader tonnage amounts to 148,000 tons, at 3.6 dwts. The machinery and plant were maintained in good running order, and worked satisfactorily throughout the year. The ventilating fan referred to in the last report has continued to run satisfactorily, the capacity being 75,000 cubic feet of air per minute, with a water gauge of 2.5 inches.

The manager, Mr. M. Tillard, reports, *inter alia*:—

"Owing to the shortage of native labour, mining operations during the year have been seriously hampered, particularly during the last three months of the period, when development had to be restricted to maintain the quantity of ore from stopes to the reduction works. The efficiency of the native labour force has shown an improvement, the tonnage handled per underground boy in 1912 having increased to 184 tons as compared with 151 tons for the previous year. The efficiency of the European force has likewise increased from 1,362 tons handled per underground man in 1911 to 1,773 tons in 1912. The cross-cut North from No. 2 shaft was, at the 31st December, 81 feet from the Main Reef Leader, and the reef was struck soon after the end of the year, assaying 181.8 dwts. over 7 inches."

The Diamond Trade.

The Diamond Special of the *Financial News* of March 14 contains the following:—"Good business in the diamond world during the week under review has again to be chronicled, and the ease with which all stocks of rough diamonds that are put on the markets are absorbed cannot fail to be more than gratifying to shareholders in the producing companies. . . . Business in cut goods also continues to be most satisfactory, and the imports into America to date are largely in excess of the returns for the corresponding periods of 1911 and 1912, having increased by over 40 per cent. The current year bids fair to establish a record all round for the diamond industry. As bearing on the above, an American expert points out that the current production of rough diamonds is about 8,000,000 carats a year, valued at about $50,000,000. It is distributed as follows:—

	Carats.	Value.
British S.A.	5,887,625	$41,000,000
German S.A.	1,000,000	6,000,000
Brazil	100,000	1,000,000
British Guiana	3,000	30,000
United States	—	2,000
All others (est.)	1,009,375	1,968,000
Total	8,000,000	$50,000,000

Adding to this the export duties and commercial profits, $40,000,000, plus the dealers' profits of $10.000,000 to $12.000,000, the total cost to consumers is now $100,000,000 a year, of which the United States pays about one-half."

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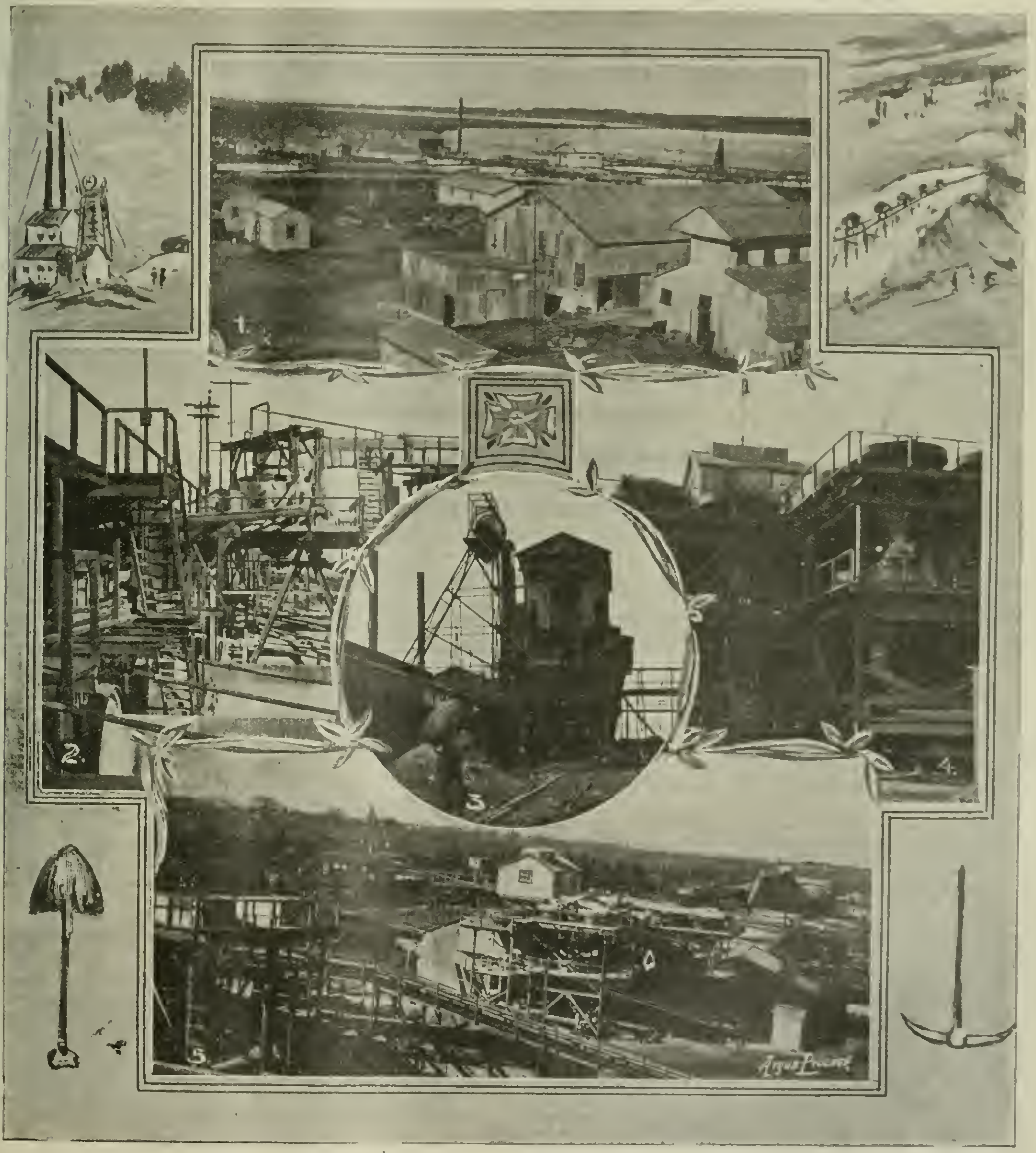
Mining Questions in the Union Parliament.

In the House of Assembly, this week, Mr. Madeley (Springs) asked the Minister of Mines (1) what was the nature of the influence brought to bear by the Department upon the directorates of the various gold mines which had been closed down upon the Witwatersrand; (2) whether he would place all correspondence connected therewith upon the table of the House; (3) whether there were any indications of such pressure being successful in causing the re-opening of any or all of these mines in the near future; and (4) whether in the event of the controllers of the said mines persisting in their policy of keeping these mines closed, he would consider the advisability of the State working the same departmentally. The Minister replied that no pressure was at present being exercised upon the directors of the gold mining companies which had closed down for want of funds. It was not considered that the Government would be justified at present in imposing the conditions of the Gold Law, but circumstances might arise when these provisions might require to be put into force. The Minister added that he would consider whether he would place all correspondence he had had with the companies upon the table. Mr. Neser (Potchefstroom) asked the Minister of Mines (1) whether he was aware that development work or mining had ceased on certain ground held under mining title by the Afrikander Proprietary Mines, Ltd., situated on the farm Rietkuil No. 126, in the mining district of Klerksdorp, and if so (2) whether he did not think that the circumstances were such that the company named might be called upon to give reasons, if any, why the development work or mining had ceased, and be further dealt with in accordance with the provisions of Section 137 of Act 35 of 1908 (Transvaal). The Minister replied that the answer to (1) was in the affirmative; in regard to (2) the company had recently been called upon to give reasons for the cessation of work, with the result that the Government was satisfied that further pressure should not be brought to bear on the company for the present. The further progress of events was receiving his attention.

THE SIMMER DEEP-JUPITER EQUIPMENT.

Extension to be Effected without Erecting Further Stamps—Scheme to take Six or Seven Months to Complete.

Although details of the proposed increases in crushing capacity at the Simmer Deep and Jupiter mines have not yet been prepared, we understand that the tonnage milled will be augmented by the pursuance of a policy of coarser crushing in the mortar boxes, the more extended use of tube mills, and the erection of additional sands and slimes vats. Six or seven months will be required to complete the programme of reduction plant reorganisation, and as a start is not likely to be made for some little time, a considerable period will elapse before the new scheme of crushing is given effect to. In any case there will not, so we learn, be any additional stamps erected, and it is, therefore, patent that



Some Views of the Simmer Deep—Jupiter Reduction Plant.

existing heads in the joint battery of these two sister deeper level propositions will be called upon to achieve a substantially higher duty than at present is being secured.

PRESENT STAMP DUTIES.

As it is to-day the duties of stamps on both the Jupiter and Simmer Deep sides of the equipment are well above the Rand average. To illustrate this we append a table which sets forth the number of stamps erected and at work, the ore milled and stamp duty for the first two months of the current year:—

	Stamps erected.	Stamps at work.	Tube Mills at work.	Days Milling.	Ore Milled. Tons.	Stamp duty per Head per Day. Tons.
January, 1913.—						
Jupiter	120	100	6	29.28	41,850	14.29
Simmer Deep ...	180	155	9	29.04	61,350	13.63
February, 1913.—						
Jupiter	120	105	6	26.43	40,800	14.7
Simmer Deep ...	180	160	9	26.52	60,150	14.18

It will be seen that out of 300 stamps erected in the joint Simmer Deep-Jupiter mill 265 were at work in February. This means that the management has a fair reserve of stamps to bring into the scheme of larger milling capacity.

At the time of a visit of a representative of this journal to the property, a few months ago, the stamps in the joint Simmer Deep-Jupiter battery were running at ninety-five drops per minute and crushing through a sixteen-mesh, the duty being about thirteen and a half tons per head per diem. There are fifteen standard twenty-two feet six inch tube mills arranged in parallel, this constituting the longest line of tube mills employed on the Rand. All plates are now stationary and are situated in the tube mill house, shaking tables having been done away with. Previous to this change the amalgamating area was 6,801 square feet, but to-day this amounts to only 2,842 feet. Caldecott tables and cones form a prominent feature in this plant. There are two tables of twenty feet diameter with a two feet six inches filter bed and one of twenty-five feet diameter with a three feet filter bed. To each table there are four primary and two washing cones.

It may be remembered that in 1910 it was reported that the Board had decided to increase the plant up to a capacity of 72,000 tons per month, whilst in 1911 shareholders were informed that, in view of the continued shortage of native labour, it was decided to revise this decision and make the capacity 65,000. Owing to the improved position of the native labour supply the Board consider this further increase is now justified, but, in view of the annual debenture liabilities which have to be met, it is necessary to be most careful before authorising capital expenditure, and therefore until the Board feel more assured that there is a sufficient water supply to carry on milling operations uninterruptedly during the current year they do not for the moment feel justified in encroaching on cash reserves for the purpose of meeting this expenditure. At the Jupiter it is intended to increase the capacity of the crushing and treatment plant up to 60,000 tons per month with a view to reducing costs to a figure which will admit of ore of a mine grade of 4.1 dwts. per ton being treated at a profit.

Our illustrations show general views of the property, including the joint treatment plant and the fifteen tube mills. When the scheme of mill extension is completed the line of tube mills will, of course, be even longer than at present.

BANTJES CONSOLIDATED.

The First Year of Dividends—Ore Reserves Show a Decrease.

LAST year was the first twelve-monthly period at the Bantjes in which all ore came direct from underground and none from the surface dumps, therefore comparisons of costs and grade with past results are not entirely equitable. It will, however, be of interest to compare the 1911 and 1912 results as follows:—

	Tons milled.	Revenue.			Working Costs.			Profit.		
			Per Ton. s.	d.		Per Ton. s.	d.		Per Ton s.	d.
1911 ...	278,540	£372,956	27	3	£319,020	23	4.3	£53,936	3	11
1912 ...	327,710	423,021	29	6	345,275	24	1	77,746	5	5

The consulting engineer, Mr. P. Cazalet, in his report, states:—

A notable increase in the amount of development accomplished can be anticipated during the early part of the current year, as a result both of the greatly improved labour position and of the policy pursued during the last two years of doing the preparatory work of shaft sinking and cross-cutting, and thus rendering available large numbers of development faces, against the time when the labour position, as is now the case, admits of increased work in this direction. The ore reserves should, therefore, at the end of 1913 show a very substantial advance in tonnage. To aid in the development of the lower levels at the Central shaft and improve the working conditions therein, a ventilating fan capable of passing 50,000 cubic feet of air at a 1-inch water gauge is being erected on the 6th level, and winzes are already connected, and are now being widened out, between the 6th and 10th levels. These will act as the return air-way, the main shaft being the down-cast; as winzes connect below the 10th level this ventilation scheme will be extended downwards through them to the 15th level. The tonnage mined for the year shows an increase of over 49,000 tons, in which is included 4 per cent. of Leader ore for the first time. The costs per ton milled show an increase of 9d., but this is satisfactory when it is remembered that all the ore came from underground, whereas during the previous year 48,000 tons were taken from surface dumps. The underground costs per ton mined, indeed, show a satisfactory decrease of 5d. per ton, and the reduction works costs a further fall of 5d. per ton milled. As a consequence of an improvement of grade recovered from 27s. 4d. in 1911 to 29s. 6d. for the year under review, the profits show an increase of 1s. 5d. per ton and average 5s. 5d. per ton milled, while the total working profit earned for the year at £77,746 shows an increase of £23,810 over 1911. The pumping plant has been extended and further concentrated during the year, a new main station having been equipped with electrically-driven pumps on the 10th level at the Central shaft. Provision is now being made for the installation of one of the spare electric pumps at the 15th level, so as to supersede entirely the more expensive and less reliable secondary air pumps. When the 10th level main drive reaches the East shaft all water will be concentrated at the three stations on the 3rd, 10th and 15th levels at the Central shaft and all other pumps entirely shut down. More use has been made of machines in the stopes than in previous years, but their use can only be justified as a palliative for labour shortage, since under the Bantjes conditions the best results from mining South Reef cannot be obtained by machine stoping. It is hoped that most of the Leader ground will prove more suited to the use of machines. The ore reserves have been recalculated as at December 31st, 1912, to be as follows:—

	Tons.	Value. Dwts.	Value. s.	d.	Stoping Width. Inches.
Main Reef	1,100	6.1	25	7	47
Main Reef and Leader ...	12,000	6.8	28	7	76
Leader	107,400	6.8	28	7	43
South Reef	720,300	7.0	29	5	40
Grand total	840,800	7.0	29	3	

Compared with the preceding year, the reserves show a decrease of about 55,300 tons and .3 of a dwt. in value.

Mr. W. W. Lawrie, the manager, states, *inter alia*:—

Development work during the year has shown that the strike dyke which occurs below the 6th level at the Central Incline cuts off most of the breaks and dykes which exist on the upper levels, and that a new series of faults and dykes have to be negotiated in the lower levels. This is a serious drawback to our development, as the data obtained from previous work cannot be taken advantage of. Fortunately, the gold contents of the reefs do not appear to be affected—the values in the lower levels being about the same as in the upper.

Sheba G.M. Co.

The following was the result of the March working of the Sheba mine:—Mill ran 30 days; crushed 6,220 tons, yielding 3,016 ozs.; estimated profits, £4,446.

THE PROSPECTS OF THE MODDER B.

Annual Reports Reflect Excellent Position.

Practically a sovereign was earned for every ton milled by the Modder B. Company last year, and since 388,570 tons were crushed the result has been very satisfactory. In connection with the reduction plant it should be noted that various minor alterations have been made increasing its capacity above the figure originally estimated. Mr. Stuart Martin, the consulting engineer of the company, states in his report:—

The general underground arrangements for handling ore in stopes and transporting it to the main hoisting shaft, which, it will be remembered, were specially designed to suit the low angle of dip at this mine, have given satisfaction. The cost of shovelling and tramming has, however, not been so low as might be anticipated, but, taken together with the cost of hoisting to the surface, the expenditure is nevertheless reasonable. The installation of small engines for running trucks direct to the stope face, and the large quantity of rails, have all been an original charge against the shovelling and tramming of ore, and as these will not be installed to the same extent, it is reasonable to look for a reduction in this important item of expenditure. The adoption of underground mechanical arrangements has made the mine unusually independent of fluctuations in labour supply, and has effected a reduction in the number of unskilled natives generally required to handle and transport ore from stope face to shaft bin. The main and tail rope system of haulage has been a decided success; it has not yet been pushed to anything like its full capacity. A prominent feature of the year's work has been the high efficiency obtained in breaking ground both by rock drills and hammer boys, and the cost of stoping has been exceptionally low in view of the moderate stoping width. Against this, however, considerable expenditure has been incurred in supporting a heavy hanging wall, and a great deal of waste packing has been done underground to secure the workings. This equivalent of underground sorting has been to some extent responsible for an increase in the value of ore sent to the surface. The ore mined has been evenly distributed over available stope faces, and the value has exceeded expectations. It has been found a little difficult to regulate the grade to a constant average from month to month. On the whole, however, taking into consideration the length of the stope faces, the grade has kept remarkably uniform. Development operations for the first half of the year were somewhat restricted, but towards the end were greatly increased. The payable ore developed amounted to 428,000 tons of a value of 7.5 dwts. or 31s. 6d. The ore reserves at 31st December, 1912, amounted to 2,591,000 tons of an average value of 7 2 dwts. or 30s. 3d., the average stoping width being 51 inches. Compared with the previous year, there is an increase of 238,300 tons, and a decrease in value of .3 dwt. or 1s. 3d., the increase in stoping width being partly responsible for these variations. Of the unpayable ore so far developed, there are 361,000 tons at 3.8 dwts. or 15s. 11d. value, which, at some future date, may be worked at a profit. The somewhat unusual conditions at this mine have been handled with steadily increasing success, and working costs, which were 18s. 11d. in January, 1912, fell to 15s. 11½d. a ton in November. Included in the working costs are two sums charged against development and renewals funds. The first item has average 1s. 10d. per ton milled for the year. It has not been possible to spend this money on development, and there is at the year's end a total accumulated cash credit of £23,091 in this account. A further sum of 6d. per ton milled has been charged out on account of a renewals fund; this has now accumulated to a sum total of £11,255.

Mr. Martin declares that the prospects for the ensuing year are in every way promising. The financial position of the company is quite secure, the ore reserve is ample and of good value, and the machinery and plant are working smoothly and economically. In his report, Mr. E. H. Clifford, the manager, states that revenue was at the rate of 37s. 4d. per ton, working costs were 17s. 8d., and the profit 19s. 8d. per ton. On capital account £22,797 was expended, mainly in connection with underground equipment. Mr. Clifford, in concluding his report, says:—

The mine and plant ran smoothly throughout the year. The monthly tonnage handled was steadily increased, and during the latter portion of the year the plant was pressed to its utmost capacity. The grade of ore mined was somewhat higher than that called for by the ore reserves. This is due to the fact that we have had an insufficient number of low grade stope faces to turn to. The expenditure on securing the bad hanging wall which obtains throughout the mine has been very heavy. Working costs have steadily improved, and averaged 16s. 5d. per ton during the last quarter of the year. The plant has been thoroughly maintained, and many minor improvements effected. Working costs have been charged with 6d. per ton milled to provide for the Renewals Suspense Account, which was increased by £9,714; no expenditure has been made from this Fund. The Development Redemption Account shows a surplus of £17,680 for the year.

THE POSITION OF THE VILLAGE DEEP.

Salient Points from Annual Reports.

In every way 1912 must be accounted a most satisfactory year for the Village Deep. The ore milled was increased, profits both on a per ton and aggregate basis were larger, the ore reserves were increased, and the value of these reserves improved. In his annual report, Mr. H. Stuart Martin, the consulting engineer, gives as interesting table, which contrasts the results obtained in 1912 with those secured in the two previous years.

The following are the chief points of interest:—

	1910.	1911.	1912.
Tons milled	507,800	569,500	596,900
Yield per ton	24s. 5.3d.	26s. 6.5d.	29s. 10.0d.
Working costs per ton	18s. 4.5d.	18s. 7.4d.	19s. 11.0d.
Profit per ton	6s. 0.8d.	7s. 11.1d.	9s. 11.0d.
Working profit declared	£154,067	£225,780	£291,810
Reserve gold at end of year, ozs. ...	709	5,600	nil.
Development footage	23,968	29,132	18,693
Tonnage of ore in reserve	1,943,600	2,159,800	2,235,300
Value of ore in reserve	6.1 dwts. (25s. 7d.)	6.1 dwts. (25s. 7d.)	6.9 dwts. (29s. 0d.)

The above table shows the steady improvement that has been made, the tonnage milled having increased since 1910 by 89,100 tons, and the profits by £140,743 or 92 per cent. It must be borne in mind, however, that of the £294,810 earned during the year, there are included £24,755 of reserve gold, the subject of a special declaration in March. As foreshadowed in the Chairman's last annual speech, it has been found justifiable to increase the value of the ore mined, owing to improved development, and notwithstanding an increase in working costs of 1s. 4d. per ton milled, the profit per ton shows an improvement of nearly 2s. The increase in working costs was due to several causes, the most important of which was an increase of 9d. per ton to the cost of development. The payable ore reserves estimated as at 31st December, 1912, are as follows:—

	Tons.	Value. Dwts.	Value. s. d.	Stope Width. Inches.
Main Reef Leader	1,684,000	7.1	29 10	59
South Reef	551,300	6.0	25 2	50
Total	2,235,300	6.9	29 0	

In addition to the reserves, there are 590,000 tons of ore blocked out, but requiring boxhole raises before valuation. Based on a percentage of payability of 80 per cent., this tonnage represents 472,000 tons of payable ore, and in this connection it is interesting to note that the Main Reef Leader, valued during the year, was all payable. The ore completely blocked out and ready for stoping shows an increase of 132,000 tons over last year, and the average value of the whole reserves has also increased by 3s. 4d. per ton. The improvement in value per ton is partly due to a reduction of 3 inches in the stoping width of the Main Reef Leader, and to an increase in the pay limit of from 4.0 dwts. to 4.3 dwts. This raising of the pay limit is necessitated by the higher working costs now prevailing. There are also developed in the mine 572,000 tons, of an average value of 3.9 dwts., or 16s. 4d. per ton, consisting of low grade ore between 3.5 dwts. or 14s. 8d., and 4.3 dwts. or 18s. 1d., the present pay limit. The greater part of this ore, with a slight reduction in working costs, will become payable. In the latter part of the year the ore from the Eastern Section of the mine was trammed along the 16th level haulage and hoisted up the Turf Shaft, relieving No. 1 Shaft to some extent, and when the new man hoist at No. 2 Shaft is ready for use hoisting at No. 1 Shaft will be discontinued. The Whiting Hoist at the Turf Shaft has been equipped with larger reels and is working well. The mine throughout is now fully equipped with every necessary device for improving health conditions; it is well ventilated by a large underground mechanical fan, and every part is supplied with water under pressure for allaying dust. The progress of the new equipment was considerably delayed by the non-arrival of plant, and of the £40,000 mentioned by the Chairman at the last annual general meeting as remaining to be spent at that date only £11,596 were expended. The estimated expenditure to complete the work in hand amounts to approximately £55,000. In this sum is included £17,000 for the underground incline hoist at No. 3 Shaft, which was not allowed for in the 1912 estimate. Other items are :—(1) Completion of electrification of plant; (2) No. 3 headgear equipment; (3) 2nd Whiting hoist at No. 3 shaft; (4) man hoist at No. 2 shaft. The prospects for the current year are promising, commencing with a good supply of labour, a large ore reserve of improved value, and ample stope faces, factors that all go towards ensuring fair returns. In view of the present good supply of labour, advantage will be taken to somewhat increase the development.

Mr. J. Whitehouse, the manager of the mine, in his report, states that of the total tonnage broken for the year 85·4 per cent. was broken by machines, large and small. He also states that the stamp duty was 9·5 tons, whilst extraction in the reduction works averaged 97·3 per cent. Continuing his report, he states: The condition of the underground workings is very satisfactory, and the water service nearly perfected. The greater portion of the tonnage from No. 1 shaft is now dropped down to No. 3 shaft, and it is hoped in two or three months' time that No. 1 shaft will be closed down, when all the tonnage from this section of the mine will be hoisted up through No. 3 shaft. The mechanical haulage at the 16th level is now working, and the work of cutting the engine chambers for the No. 3 main incline hoist is well in hand. The incline has nearly reached the 20th level. This incline shaft has been deepened a further 440 feet, making its total depth from the vertical shaft 657 feet, or 123 feet below the 19th level.

TRANSITION PERIOD AT GELDENHUIS DEEP.

"A Trying Period"—Profits and Ore Reserves Decrease—The Maximum Mill Tonnage Anticipated.

ADMITTEDLY 1912 was an unsatisfactory year at the Geldenhuis Deep, and although there are good prospects of the position improving materially during the current year, no attempt is made in the reports now before us to disguise the fact that the operations for the past twelve months resulted most unsatisfactorily. *Inter alia*, the consulting engineer writes:—

The main features of the operations for the year ended 31st December, 1912, as compared with the previous year, are as follows :—

	Year ending Dec. 31, 1911.	Year ending Dec. 31, 1912.
Tons milled	801,860	627,960
Yield per ton milled	27s. 9d.	30s. 2d.
Working costs per ton milled ...	22s. 1d.	25s. 10d.
Working profit per ton milled ...	5s. 8d.	4s. 4d.
Working profit, including profit from accumulations	£236,125	£141,987
Payable ore reserves at end of year	2,262,840 tons at 6.2 dwts.	1,904,700 tons at 6.3 dwts.

The tonnage milled was disappointing, being 173,900 tons below last year's crushing. Owing to the gradual diminution of the ore reserves in the North Section, the North Mill was closed down in January, since when the milling capacity of the mine has stood at 60,000 tons per month. The company has passed through a trying period, largely owing to scarcity of native labour, particularly in the latter part of the period under review, and at no time throughout the year could the mill be run at its full capacity, to the serious detriment of costs and profits. For the same reason the development could not be as actively proceeded with as was intended. The footage accomplished was 29,459 feet, and the ore exposed was 984,480 tons, of which 433,410 tons, or 44 per cent., were estimated as payable, at an average value of 6.9 dwts. The percentage payable for the previous year was 45 per cent., and the value 6.7 dwts. The working costs at 25s. 10d. are abnormally high, attributable to the scale of operations having been much below that for which the workings and plant have been designed, and to the extraordinary expenditure during the year having been heavier than usual in connection with sand-filling and packing under the South African Railway; erection of new steel headgear; additional charges in connection with the closing down of the North Reduction Plant, and increased cost of development charged to working costs—the charge for the latter item having been increased from 2s. to 3s. 6d per ton milled since the close of the previous year. The payable ore reserves at the 31st December, 1912, were estimated as follows :—

	Tons.	Value. Dwts.	Value. s. d.	Stoping Width., Inches.
Main Reef	630,900	5.8	24 4	57
Main Reef Leader	577,200	6.7	28 2	40
South Reef	696,600	6.4	26 11	49
Total	1,904,700	6.3	26 6	—

Compared with the previous year there is a decrease of about 358,000 tons, while the average value shows a slight increase of 0.1 dwt. per ton. Insufficient development as referred to above, and an increase in the pay-limit of the East Section of 0.3 dwt., are responsible for the reduced tonnage. In addition to the above ore reserve, there is developed a large tonnage of unpayable ore, representing the accumulation since commencement of mining; of this tonnage there are some 1,967,000 tons, averaging 4.0 dwts., made up of blocks between 3.5 dwts. and the present pay-limit. A reduction in working costs will bring some of this ore into the sphere of profitable working. Sand-filling and waste packing were carried on during the year, and have materially helped to steady the hanging measures. Considerable trouble was at times experienced with the sand-filling owing to falls of ground, resulting in breakages of the pipe lines and barricades. The underground stage hoist in No. 2 Incline came into commission in March, and towards the end of the year a new steel headgear was completed at the collar of No. 2 Vertical Shaft. The additional winding facilities thus afforded at this shaft are a step towards concentrating hoisting operations by closing down No. 1 Shaft. There are at present six winding shafts on the property, too large a number for economical hoisting in view of the tonnage treated, and it is hoped that during the coming year two of these will be closed down. In order to improve the ventilation in the bottom levels of the East Section, arrangements are being made for the erection of a fan with a capacity of 150,000 cubic feet of air per minute at the collar of No. 1 Shaft. The machinery and plant generally have been maintained in good running order. The results of the year's work, as already indicated, are unsatisfactory. The chief cause of the decreased profit has been the small tonnage milled, as referred to above, with consequent excessive working costs. An improvement, however, was effected towards the close of the year, and the working costs for January, 1913, show a reduction of 3s. per ton as compared with November, the tonnage having been increased to 54,800 tons milled, as compared with 45,900 tons and 49,500 tons milled respectively in November and December, 1912. The grade of the ore reserves continues satisfactory, and it is confidently expected that the tonnage in reserve can be much improved, and that, provided the present labour force is maintained, of which there are hopeful indications, the maximum ore output will shortly be reached and proportionate profits realised.

Kolmanskop Diamonds.

The output of diamonds from this company's property at Luderitzbucht for the month of March was 12,207 carats.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, Johannesburg; Box 2061.

THE YEAR AT THE ROSE DEEP.

Improved Profits and Somewhat Increased Ore Reserves—Substantial Economies Effected.

At the Rose Deep the principal features of the last two years' operations are reported by Mr. B. Madew, the consulting engineer of the company, as follows:—

	Year ending Dec. 31, 1911.	Year ending Dec. 31, 1912.
Tons milled	695,000	782,200
Yield per ton milled	27s. 11d.	28s. 10d.
Working costs per ton milled	17s. 11d.	17s. 5d.
Working profit per ton milled ...	10s. 0d.	11s. 5d.
Total declared working profit	£349,030	£446,824
Payable ore reserves at end of year	3,670,160 tons. at 6.0 dwts.	3,695,100 tons. at 6.1 dwts.

In the early part of the year the gold reserve fund was abolished, and the sum thus released, £25,700 has been included in the yield and profit for 1912, equivalent to 8d. per ton milled. The results accomplished have been very satisfactory. With no enlargement of the crushing plant, the tonnage milled represents a substantial increase, equivalent, on an average, to something over 7,200 tons per month; the yield shows an improvement, working costs have been reduced, and the total profit declared is nearly £100,000 greater than that of the previous year. Close attention has been paid by the management to the economical working of the mine, and, whilo the costs average 17s. 5d. as compared with 17s. 11d. per ton for the previous period, the reduction effected is nearly twice as much as is apparent from the above figures, as the working expenditure for the year under review includes extra charges, to the extent of 5d. per ton, incurred in sand-filling, development, and alterations to comply with new Government Mining Regulations. The development footage accomplished amounted to 11,499 feet, and exposed 737,346 tons of ore, of which 686,748 tons, or 93 per cent., were estimated to be payable, having an average value of 6.7 dwts. The payable ore reserves at the 31st December, 1912, were estimated to be as below:—

	Tons.	Value. Dwts.	Value. s.	d.	Stoping Width. Inches.
Main Reef	1,482,400	5.8	24	4	61
Main Reef Leader	333,100	6.9	29	0	40
Main Reef Leader and Bastard combined	625,400	5.7	23	11	54
Main Reef Leader and South Reef combined	638,800	6.2	26	0	60
South Reef	615,400	6.4	26	11	47
Total	3,695,100	6.1	25	7	

Compared with the previous year there is a slight increase in tonnage of 24,940 tons, while the grade is fractionally higher. In addition to the above ore reserves, it is estimated that the unpayable tonnage developed amounts to 497,000 tons, having an average value of 3.0 dwts. The prospects of your company are bright. The ore reserve is substantial and well ahead of the mill; the underground workings generally and the surface plant are in sound condition, and, provided the native labour force remains satisfactory, it may be expected that the good results obtained for the year under review may be continued, if not improved upon.

Mr. A. J. Walton, the manager, reports that sand filling was commenced in February and that 56,915 tons of sand were lowered into the mine at the No. 1 shaft, which is the only one requiring support of this nature. The stopes on each side of the shaft, which is the only one requiring support of this nature.

MINING MEN AND MATTERS.

Mr. F. C. Bigger has been appointed Acting Chairman of the Miners' Phthisis Board.

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Messrs. John Mackillican and W. E. Ferryman, auditors and accountants, have entered into partnership under the title of John Mackillican and Ferryman.

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The following is a list of the chief certificates issued by the Mines Department during the year ended December, 1912:—Mine Managers' Certificates.—Metalliferous, first-class (by examination): D. Adam, H. E. Allen, G. M. O. Barclay, R. Barrow, P. A. Cloete, G. S. Cochrane, M. H. Coombe, S. de Smidt, F. G. Dunning, J. M. Frew, A. Gilbertson, C. H. Greathead, R. A. Hunter, H. F. Knauer, C. F. Lamb, D. S. Leech, C. Lipschitz, L. W. Macer, C. Marx, B. O. Orpen, G. S. Paterson, S. Piasecki, K. O. Powrie, T. T. Retief, F. P. Rolfe, A. H. Stephens, H. E. G. Stephens, R. S. G. Stokes, E. G. Sudlow, G. Tucker, F. K. von Mengershausen. E. F. V. Wells. Metalliferous, Service: D. V. Burnett, H. T. Dickinson, J. Garland, J. Gouldie, J. M. Jones, W. Nichol, P. B. Osborn, E. Parsley, J. H. Paull, A. F. Williams, T. J. Woodburne. Coal (by examination): J. Baillie, D. L. Evans, S. Nettleton, M. Quick. Coal, Service: J. A. Bloor, J. T. Boles, J. Colbe, W. Lea, J. Lisle, W. Mullins, W. Nichol, T. Pearson, H. W. Pursglove. Second Class, by examination: C. F. Lamb (metal); G. B. Godwin (open cast diamonds). Diamond, Service: C. E. Addams, A. F. Brigham, R. G. Burnett, P. N. Debell, R. Scott. Open cast diamonds, Service: G. H. Alexander, W. J. Armstrong, S. F. Day, A. Falck, A. Reid, F. W. Robb, H. Schultz, W. S. Whitworth. Mine Surveyors' Certificates (by examination).—D. Adam, E. L. Adams, C. A. Albu, A. Anderson, A. J. Anderson, D. E. Baxter, E. Beadon, H. C. F. Bell, P. J. L. Bok, V. C. H. R. Brereton, P. A. Creewel, H. Crombie, C. E. Donne, C. E. Fradgley, L. R. Gaul, N. J. Hall, A. Haworth, A. E. Hooper, T. E. O. Hull, P. W. Kerr, N. C. Krone, L. Leger, R. G. Letters, J. A. Loubser, L. H. Maasdorp, L. W. Macer, D. G. Malherbe, L. McClure, W. M. Munro, R. A. Perkin, S. Reinheimer, A. T. Roberts, W. Scott, E. W. Seeman, R. H. Skelton, E. Summers, J. Thorlund, M. J. Turner, C. O. Wraith, H. H. Yuill. Service: C. E. Addams, E. C. Alderson, R. Allingham, W. A. Anderson, R. E. Antrobus, J. J. Armstrong, W. F. Betty, B. G. Bisset, J. J. Bisset, W. Bosman, B. W. Brayshaw, A. F. Brigham, W. M. Colenbrander, E. S. Currey, D. de Korte, T. de Smidt, T. V. de Villiers, T. N. Dewar, J. Donelly, B. Douglas, C. S. Douglas, H. A. Dykerman, W. M. Edwards, F. S. Elphinstone, St. V. W. Erskine, C. W. Evans, W. R. Farquhar, J. H. Fehrsen, E. W. Ferguson, J. L. Flanagan, J. F. O. Friedrich, C. O. Gilbert, C. W. Gracie, W. H. Greathead, C. Hall, A. Hammar, W. M. Harries, E. Harrison, G. Heslop, A. H. Hill, J. Hislop, G. R. Horne, W. N. Horne, L. J. Howes, C. L. Hull, A. W. Irvine, N. W. Jarvis, C. O. Jenkyn, E. A. Jones, A. A. Jorgensen, T. K. K. Jurisch, W. E. Kolbe, P. S. Krige, W. R. Lanham, H. L. M. Liebbrandt, C. D. Lucas, H. J. Maarschalk, O. Maasdorp, C. Marais, A. H. Matthews, H. K. Matthews, D. M. McBean, L. McBean, R. D. McLeish, E. C. J. Meyer, F. A. Middleton, W. W. Moon, S. A. Morom, H. E. Morris, E. A. Muhl, W. B. Murray, C. V. Neser, W. Newdigate, W. H. Nott, J. H. Orpen, M. G. Parsons, A. Penning, A. C. Perry, A. D. Philip, W. W. Phillips, W. R. C. Piers, W. H. A. Pritchard, B. A. Putterill, E. Rees, W. J. A. Reid, H. F. Richardson, V. G. Salmon, J. C. Samuel, H. E. Shoch, A. E. C. Schreiber, C. H. Scott, H. W. Seymour, T. G. C. Seymour, A. O. Shone, A. P. Simpson, H. S. K. Simpson, W. G. Stanly, J. H. Steere, J. B. Stewart, T. T. Stranach, S. D. Tennant, C. D. J. Theron, C. F. Thomas, E. G. Thomas, C. P. Tompkins, J. B. Tucker, K. R. S. Tucker, W. K. Tucker, W. C. van der Sterr, Melt van der Spuy, M. L. van der Spuy, A. G. van Landsberg, V. A. Verner, D. Walton, H. Walton, R. W. Watson, G. A. Watermeyer, F. J. Watermeyer, F. K. Webber, R. C. Willson, F. A. A. Wolfe. Mechanical Engineers' Certificates.—By examination, with endorsement of *Mining Machinery*: J. Blythe, W. M. Bowman, W. C. Brown, S. Cochran, H. Denehy, H. Gould, C. F. Henwood, W. E. John, A. M. Kratz, F. le Fort, P. R. Levick, T. S. Lewis, A. Marr, H. Martin, J. H. Mill W. A. Moore, T. A. Roberts, A. E. Scott, J. E. Stone, H. M. West, J. Williamson, R. Wilson, J. Wood. By examination, "Works": T. Curr, H. Denehy, G. B. Godwin, W. G. Henderson, E. J. McWilliams. Service, with endorsement of *Mining Machinery*: E. Bailey, J. F. Cochran, V. Crewe, A. Dickson, J. Fulton, J. E. H. Grose, J. Harbottle, G. R. Harris, T. J. W. Holland, C. King, J. Liddell, P. Macadam, T. Marshman, W. McAllister, J. B. Morland, C. Mullins, W. W. Nisbet, J. B. Pender, W. Pritchard, J. Smith, L. M. Smith, W. R. Swann, W. Tait, T. Tate, W. Thomas, A. Turnbull, W. Varley, T. F. Wilson, E. H. Woodman. Service, "Works": E. E. Briggs, C. E. Brown, T. R. Butler, J. H. Dobson, W. R. Fowler, J. F. Horneman, G. Hudson, T. E. Jackson, J. Lang, F. S. Lynch, R. Macaulay, H. V. MacLennan, M. McKenzie, C. O. Petersen, A. Pollmann, C. M. Read, H. T. P. Rigby, J. H. Rowland, J. W. Schofield, R. Scott, J. Stamp, G. C. I. Stuart, G. H. Swingler. Electrical Engineers' Certificates.—By examination, with endorsement of *Mining Machinery*: W. F. M. Bowman, P. Cordiner, C. H. Clutterbuck, T. A. Dryden, R. W. Fowler, F. le Fort, H. Martin, E. V. Perrow. By examination, "Works": A. W. Aikman, T. Maddren, W. A. Moore, H. A. Morris. Service, with endorsement of *Mining Machinery*: J. Askew, W. C. Brown, T. P. E. Butt, H. W. Clayden, E. G. Clifford-Jones, W. F. J. Cosser, E. Ehrenberg, S. E. T. Ewing, H. J. S. Heather, H. J. Holder, R. G. Mackie, C. Mullins, J. P. Nelson, H. Newberry, R. W. H. Smith, P. M. Tennick, L. H. Wilms. Service, "Works": E. E. Briggs, J. H. Dobson, J. Lang, R. E. F. Rascher, C. M. Read, C. M. Robertson, G. C. I. Stuart, G. H. Swingler, F. C. Williams, W. H. Wishart.

THE MARCH OUTPUT: GROUP RETURNS.

Features of Month's Work Reflected in Figures.

Rand Mines Group.

The following are the results of crushing operations of the Eckstein companies of the Rand Mines, Ltd., for March:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	35,250	15/7·2	15,583	£37,988
New Modder. ...	180	7	52,000	19/8·9	24,058	49,299
City Deep	150	9	45,400	23/7·1	20,574	32,623
Village Deep ...	180	7	51,200	18/9·6	17,290	24,470
Village Mn. Reef	220	6	38,740	18/3	16,778	34,802
Robinson	250	6	59,600	13/4·3	25,904	68,893
Bantjes	100	3	29,850	21/11	9,514	7,155
Totals & averages	1160	43	312,040	18/5·8	129,701	£255,230

The following are the results of crushing operations of the subsidiary companies of the Rand Mines, Ltd., group for March:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	69,810	16/5	22,344	£36,619
Geldenhuis Deep	300	7	57,800	24/3·8	20,569	16,120
Nourse Mines ...	260	7	53,300	21/2·9	19,887	26,805
Ferreira Deep ...	250	7	55,140	19/11·5	28,786	65,695
Crown Mines ...	660	26	201,000	16/8·7	70,513	128,193
Durban Rood. D.	100	3	25,460	24/6·4	9,034	6,745
Totals & av'ges	1870	57	462,510	18/11·6	171,133	£280,177

Barnato Group.

The following are the results of operations for last month on the producing mines of the Barnato group:—

COMPANY.	STAMPS.	TONS.	REVENUE.	PROFIT
Consolidated Langlaagte .	100	41,900	£59,362	£20,241
Ginsberg	80	15,095	20,869	6,554
Glencairn Main Reef ...	160	21,216	16,887	3,035
New Primrose	160	25,300	36,273	19,130
New Rietfontein	120	16,800	18,899	3,506
New Unified Main Reef...	60	12,480	16,800	5,171
Quest	30	3,909	3,379	447
Witwatersrand	220	38,800	50,250	23,068
March totals ...	930	175,500	£222,719	£81,152
February totals ...	930	160,683	£208,772	£74,114

The monthly profits for 1913 are: January, £79,198: February, £74,114; March, £81,152.

Goerz Group.

The following are the results of operations of the crushing mines comprising the Goerz group for last month, viz.:—

	No. of Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	15,620	£15,295	£4,089
Princess Estate ...	60	5	22,800	29,155	2,213
Geduld	50	2	14,300	17,439	2,252
Totals ...	210	7	52,720	£61,889	£8,554

Geduld Proprietary Mines, Ltd.—Decreased profits due to preparation of the mine for the enlarged reduction works, the same cause may also interfere with profits for further two months. Enlarged plant is expected to be in operation in June.

The monthly profits for 1913 are:—January, £15,417; February, £10,317; March, £8,554.

The Albu Group.

The March operations of the producing mines of this group were as follows:—

Company.	Stamps.	Tube Mills.	Tons Crushed	Total Cost.
Aurora West	80	—	14,222	£14,500
Cinderella Consolidated ...	85	3	18,340	24,445
Meyer and Charlton	75	2	14,506	13,053
New Goch	120	4	28,260	21,926
Roodepoort United	50	3	26,000	24,933
Van Ryn	135	6	39,580	30,253
West Rand Consolidated ...	100	4	29,250	34,820
	645	22	170,158	£163,930

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	20/ 4·7	£18,789	£4,289
Cinderella Consolidated ...	26/ 7·9	23,991	*454
Meyer and Charlton	17/11·9	33,615	20,562
New Goch	15/ 6·2	28,249	6,323
Roodepoort United	19/ 2·1	24,189	*744
Van Ryn	15/ 3·4	55,380	25,127
West Rand Consolidated ...	23/ 9·7	43,547	8,727
		£227,760	£65,028
Less loss			1,198
Net profit			£63,830

* Loss.

Neumann Group.

The following are particulars of the results achieved by the crushing companies in this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep	38,920	£58,585	£20,738
Wolhuter	28,200	35,909	10,329
Consolidated Main Reef ...	22,557	33,396	11,077
Main Reef West	21,042	30,469	7,261
Knight Central	25,800	26,337	2,512
Totals			£51,917

The monthly profits for 1913 are:—January, £53,085; February, £46,112; March, £51,917.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for last month of the undermentioned companies of the Consolidated Gold Fields group:

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit
Simmer and Jack ...	320	7	80,900	18,668	£38,540
Robinson Deep	160	10	61,000	19,286	32,629
Knights Deep	100	9	110,100	19,369	25 024
Simmer Deep	160	9	63,750	12,253	7,065
Jupiter	110	6	44,250	10,021	5,193
Sub Nigel	20	1	5,060	2,184	2,305
Totals	1170	42	365,060	81,781	£110,756

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £2,500; Robinson Deep, £415; Knights Deep, £606; Simmer Deep, £525; Jupiter, £190; Sub Nigel, £384; total, £4,620.

Reserve Gold.—Simmer and Jack, 850 ozs.; Robinson Deep, 1,000 ozs.; Simmer Deep, 1,500 ozs.; Jupiter, 1,200 ozs.; Sub Nigel, 600 ozs.; total, 5,150 ozs.

Knights Deep.—Of the total profit, £3,333 must be deducted in terms of circular to shareholders, dated 26th September, 1912.

Rhodesian Section.

LATEST MINING NEWS.

The Lonely Reef—New Zealand Mine—London and Rhodesian Company's Affairs—Associated Mines of Rhodesia.

We take the following from the report of the Lonely Reef G.M. Co. for quarter ended December 31:—Driven, risen, and sunk, 919 ft. Added to reserves during period, 21,331 tons. Ore reserves at end of quarter, 174,529 tons. Average assay value, 22·4 dwts. Tons milled, 10,212. Yield in ozs. of fine gold, 9,676·483. Profit, £21,956. Capital expenditure, £8,065. The general manager writes:—"The water supply, which in any ordinary season would be ample for all of our requirements, has not been sufficient to allow us to run full time. . . . The working cost for the quarter, including all administration expenses in London and Bulawayo, but not including royalty to the B.S.A. Company, is just under 33s. 6d. per ton. This is a higher figure than that of the July quarter, and is accounted for chiefly by the lesser tonnage treated and to some extent by the total cost of relining the No. 2 tube mill and of replacing the wrecked portion of the mill engine being charged out during the quarter. Now that we are in a position to mill to our full capacity there should be an appreciable reduction made on these figures, and when the additional stamps are working, thus increasing our monthly tonnage, a further reduction per ton will be made. Capital expenditure . . . is unusually high on account of additions to the plant, consisting principally of the evaporative condenser and additional machine tools in the workshop. The supply of native labour has been hardly sufficient for our needs, but arrangements have been made to improve it. . . . I hope during the next three months to have the additional five stamps erected. When these are in we should be able to crush nearly, if not quite, 5,000 tons per 28 days of running time."

* * * *

The New Zealand—one of the first gold mines, if not the first gold mine in South Africa to be worked—was re-started by Mr. W. A. Ryan recently, and in the four months to the end of February he has recovered 902 ozs. from 2,255 tons treated. The profits from this amount to about £1,150. The ore is being drawn from the 11th level and development results are quite encouraging, sufficient good rock to keep the ten stamps going for a year being already in sight. It is now proposed to add a tailings plant to the present equipment.

* * * *

The London and Rhodesian Mining and Land Company has secured the services of one of the most experienced mine managers in Western Australia, in the person of Mr. MacDermot, lately the manager of the well-known Sons of Gwalior and Ivanhoe mines. Mr. MacDermot, who will take over the management of the Cam and Motor, is now on the water, and may be expected to arrive in the course of a few weeks. The "Lonrho" management are also very keen on their Makaha claims, and a very substantial scheme of development work is in progress. These claims occupy a large area, and if the anticipations of Mr. Gordon Dickson should be realised, the Weil group will find themselves in possession of another of the biggest propositions in the country. Recently Mr. E. C. Pulbrook, accompanied by Mr. Pocklington, left on a visit of inspection.

* * * *

The following cable has been despatched as to development at other properties of this group:—"Radnor. Total footage driven and sunk for February was 145 ft. Shaft No. 1. delayed through heavy rain and non-arrival of timber, now making good progress. At 108 ft. reef is well mineralised, assaying 12 dwts. per ton over 106 ins. East drive on parallel reef off cross-cut No. 1 south; drive extended 10 ft., total 10 ft., assaying 1 oz. 5 dwts. per ton over 30 ins.; driving west started face looks well. Cross-cut No. 3 south intersected continuation new reef at 40 ft. further west assaying 7 dwts. per ton over 30 ins. Newman. Adit driven 37 ft., total 139 ft., low values. North cross-cut from shaft No. 2 100 ft. level, driven cross-cut 38 ft., cut reef at about 23 ft., no value; drive from cross-cut driven 24 ft., low values. Downton. Winze 116 ft. in adit; winze has been sunk to a depth of 7 ft.; have not yet received assays. Kelly's. Completed sampling 40 ft. level; drive assaying 1 oz. 17 dwts. per ton over 53 ins. for a length of 63 ft.; cross-cut through lode at 40 ft. level assaying 2 ozs. 4 dwts. per ton over 116 ins.; cross-cut at 90 ft. level assaying 4 dwts. 6 grs. per ton over 144 ins.; cross-cut at 110 ft. level assaying 11 dwts. per ton over 120 ins. Koodoo. Samples from drive from 60 ft. level assaying 9½ dwts. per ton over 60 ins. for a length of 283 ft., width of reef not fully exposed along portion of drive."

* * * *

The closing down of the Salisbury office of the Associated Mines of Rhodesia has occasioned considerable comment in Rhodesia. The following particulars of some of the assets of the company may be of interest:—Its claim holdings are considerable—in all some 80 blocks. In the Shagari district the company owns the Amorosa, the Dawn, the Hard-up, the Haji, Ward's Block, the Begum, and Shaw's claims, and, in the Enterprise district, the Jolly Boys; at Mazoe they have the Chin, and at Lomagundi the Shankuru. The Amorosa is, perhaps, the best of the Shagari lot, and is now let on tribute. It was acquired by Mr. Hollins some two years ago from Messrs. C. H. Wheildon, H. B. Douslin and Morrisby, and it is undoubtedly a promising property. On the Dawn the ore reserve amounts to 7,500 tons, valued at 35s. per ton, and a moderate amount of work has also been done on the Haji and the Hard-up, both of which are narrow reefs, though the latter is very rich. But among the best of Mr. Hollins' properties are unquestionably the Shankuru, the Jolly Boys and the Chin. At the Shankuru, however, there are at present no ore reserves, but at the Jolly Boys some 7,000 tons, valued at 15s., have been blocked out; whilst at the Chin no less than 75,000 tons, worth from 36s. to 37s., have been exposed. The Chin is in a far more advanced state of development than any of the other properties, and it is rumoured that the Goldfields people are negotiating for it.

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THE WEEK IN THE SHAREMARKET.

Better—Improving Outlook in Europe.

THE crisis in Europe seems likely to end favourably, and all markets are feeling relieved. The South African section is bound to be among the first to feel the benefit of any improvement, and already there is a hardening tendency noticeable. The batch of annual reports issued this week all reflect a strenuous and not unsatisfactory year. In addition, excellent reports are to hand from the mines, and it may be said that the intrinsic value of Rand stocks was seldom better. Tins and diamonds are firmer in sympathy, and, in the event of a good general market cannot fail to rise.

	* Friday, 4th.	* Sat., 5th.	* Mon., 7th.	* Tues., 8th.	Wed., 9th.	Thurs., 10th.
Adam Ushers ..	0 3B	0 3B	—	—	—	—
African Farms ..	16 6B	16 9B	16 9	16 3	16 0B	16 6B
Apex Mines ..	26 3B	26 6	26 0B	26 0B	26 0B	26 3B
Bantjes Consolidated	22 6B	23 0B	—	—	23 0B	22 0B
Benoni Consolidated	3 0B	—	3 0	3 2s	—	2 9B
Blaauwbosch Diam.	*98 6	100 0	—	—	—	—
Brakpan Mines ..	90 0s	90 0s	88 6	—	86 0B	87 6B
Breyton Collieries	—	33 0s	30 0B	31 0	31 6B	—
Bushveld Tins ..	0 11B	0 11B	0 11B	0 11B	—	0 11B
Cassel Coal.. ..	—	12 6B	—	12 6B	—	12 6B
City & Subs. (£4)...	47 3B	47 6	47 9	47 9	48 0	49 0
City Deeps.. ..	66 0B	66 0B	65 0B	66 0B	66 6B	67 0B
Cloverfield Mines ..	6 0B	6 1B	6 2s	6 0	5 10	5 11B
Clydesdale Colls. ..	8 6B	8 6B	8 6B	—	8 6B	—
Concrete Const. ..	4 0B	4 0B	4 0B	4 0B	4 0B	4 0B
Cons. Investment ..	—	—	—	—	21 0B	21 6
Cons. Langlaagtes	28 3B	28 3B	28 6	28 0	28 0B	28 0B
Cons. Main Reefs ..	19 3B	19 6	19 6	19 0B	19 0B	19 3B
Cons. Mine Select.	13 0B	14 0s	14 0s	—	—	14 0s
Coronation Colls....	17 0s	—	—	14 6B	—	—
Coronation Freeholds	0 6B	—	0 6B	0 4B	—	0 5B
Crown Diamonds...	4 3B	5 6B	5 6B	4 0B	—	4 6B
Crown Mines ..	142 0B	142 0B	142 0B	—	—	142 6B
East Rand Centrals	9 9B	9 9B	9 6B	9 6B	9 6B	9 9B
East Rand Coals(2/6	—	—	—	1 11	1 9	1 10
East Rand Deeps ..	2 8B	—	2 6B	—	—	2 7B
East Rand Debs....	£95	£94B	£95	£94B	£93B	£94B
East Rand M. Est.	—	7 6B	—	7 3B	—	7 3B
East Rand Props.	58 0s	57 0B	55 0B	58 0s	58 0BS	—
Eastern Golds (1/-)	2 0B	2 0B	—	1 11B	1 9B	1 10B
Frank Smith Diam.	11 3B	11 6B	11 6B	11 6B	—	11 6B
Geduld Props. ..	—	—	21 0B	21 6B	21 6B	21 9B
Geldenhuis Deeps	30 0B	—	—	—	—	30 0B
General Minings ..	18 0B	18 0B	18 0B	18 0B	18 0B	18 0B
Glencairns	—	—	2 9B	2 9B	—	
Glencoe (Natal) Colls.	7 0B	—	7 6	7 0B	7 0B	7 0B
Glynn's Lydenburgs	23 0s	22 6s	—	22 6	20 0B	20 6B
Government Areas	21 0B	21 0B	21 0B	20 9B	21 0	21 0B
Hex River Expls.	0 6B	—	1 0	1 0B	0 11B	1 0B
Jumpers	4 6B	4 6B	5 0s	—	—	4 0B
Jupiters	9 9B	10 3B	10 3B	10 3B	10 0B	10 3B
Kaalfontein D.(2 6).	0 5s	0 4B	0 4B	0 4B	0 4B	0 4B
Kleinfontein Estates	18 6B	18 6B	—	—	—	18 6B
Klerksdorp Props...	2 10B	3 0	2 1B	2 11	2 10B	2 11B
Knight Central ..	13 0B	13 3	13 3	12 9	12 9B	12 9B
Lace Props ..	3 5B	3 6B	3 6B	3 7	3 9	3 6B
Luipaardsvlei Est.	8 3B	8 0B	—	8 3B	8 0B	8 [illegible]B
Lydenburg Gold Fms	2 7B	2 7B	2 7B	2 7B	2 7B	2 7B
Main Reef West ..	16 9B	17 6B	17 0B	16 6B	16 0B	16 6B
Main Reef Wests Debs	—	—	—	—	—	£93B
Meyer & Charltons	107 6B	—	—	—	—	—
Middlevlei Estates	—	1 0B	1 0B	1 2	1 2B	1 3
Modder B's.. ..	76 0B	75 0B	76 0	75 6	76 0B	77 0B
Modder Deeps ..	39 0	39 0	39 0	37 0	37 0	37 0B
Natal Navigation Col.	—	15 6B	—	—	—	—
New Boksburgs ..	1 3B	2 0s	—	2 0s	1 0B	—
New Eland Diam...	—	—	27 0s	—	29 0s	—
New Era Cons. (5/-).	7 9B	8 0B	7 9B	7 9B	7 9B	7 9B
New Geduld Deeps	2 5B	2 4B	2 4B	2 6s	2 4B	—
New Kleinfonteins	21 6B	21 6B	21 6B	21 6B	21 6B	21 6B
New Modders ..	—	—	—	247 6s	—	—
New Rietfonteins ..	6 0B	6 0B	—	—	6 0B	6 0B
New Unifieds ..	14 0B	—	14 0B	14 0B	14 0B	14 0B
Nigels	—	—	—	18 0s	—	17 6s
O.F.S & Trans. Dia.	1 9B	1 9B	1 6B	—	1 8B	1 9B
Paardekraal Estates	—	0 6B	—	—	—	—
Pickstone Golds ..	—	—	—	—	30 0B	30 0B
Potchefstroom Est.	—	0 9B	—	—	—	—
Premier Pref. (5/-)	172 6B	172 6B	—	—	172 6B	172 6B

* Odd Parcels. s Sellers. B Buyers.

	Friday, 4th.	Sat., 5th.	Mon., 7th.	Tues., 8th.	Wed., 9th.	Thurs., 10th.
Pretoria Cement Co.	52 0B	—	51 0B	51 0B	—	51 0B
Rand Collieries ..	—	6 0B	6 0B	6 0B	—	—
Rand Klips ..	1 6B	1 6B	1 8B	1 9	1 6B	1 6B
Rand Nucleus ..	2 8B	2 8B	2 8B	2 8B	2 8B	2 8B
Randfontein Deeps	5 3B	6 0s	5 9s	5 6s	6 0s	4 9B
Randfontein Estates	28 6B	28 9B	28 0	28 0B	28 3B	28 6B
Roberts Victors ..	35 0B	35 0B	35 0B	—	—	—
Robinson Deeps ..	39 6B	—	38 6B	—	—	38 0B
Rooiberg Minerals	34 9B	35 6B	35 9	35 9B	35 3	36 0B
Rood. Durban Deeps	—	—	23 0B	—	123 0B	23 6B
Ryan Nigels ..	3 3B	3 6B	3 6B	3 6B	3 6B	3 6
Shebas	5 0B	5 3s	5 0B	5 0B	5 3s	5 0B
Simmer Deeps ..	3 3	3 3	3 2B	3 0B	3 1B	3 3s
S.A. Breweries ..	—	—	—	—	40 0B	40 0B
S.A. Lands ..	4 3	4 3	4 3	4 2B	4 2	4 2B
Springs Mines ..	15 9B	16 0B	15 3	15 0	15 0B	15 9B
Sub Nigels ..	13 0B	13 3	13 0B	13 3s	13 0B	13 0
Swaziland Tins ..	32 6B	32 6B	35 0s	32 6B	32 6B	32 6B
Trans. Coal Trusts	49 3	49 0	48 6B	47 3B	47 3B	47 9B
Trans. G.M. Estates	53 6B	—	54 0s	53 0B	54 3s	53 0B
Tudors	2 0s	2 0s	—	—	—	2 0s
Van Ryn Deeps ..	26 3B	26 9	26 3	26 0	26 6	26 6B
Village Deeps ..	43 0B	43 6B	—	42 0B	43 6B	43 9B
Vogel. Cons. Deeps	1 6B	—	1 6B	—	1 0B	—
West Rand Estates	—	—	4 0B	—	4 0B	4 0
Witbank Collieries	—	46 0B	46 0B	46 0B	—	47 0B
Witwatersrands ..	—	—	—	62 6B	—	63 0B
Wit Deeps ..	53 6B	53 6B	53 0	52 6B	52 6B	52 9B
Wit. Townships ..	—	—	—	—	25 0B	25 0B
Wolhuters	17 0B	17 6	17 0B	17 0B	17 3	17 0B
Zaaiplaats Tins ..	35 6	35 6B	35 6B	35 6	35 9	35 6B

* Odd Parcels. s Sellers. B Buyers.

The Action of Oxidisers in Cyaniding.

The *Journal* of the Chemical, Metallurgical and Mining Society of South Africa for the month of February, amongst other interesting articles, contains a paper by Mr. Morris Green on "The Action of Oxidisers in Cyaniding." The paper is a very thorough contribution and the author has evidently devoted a great deal of valuable time and work to the subject. Mr. Green, in concluding his paper, remarks: From the results embodied in this paper it would appear, too, that the assistance given by oxidisers in the dissolution of gold is of a secondary nature. Unlike free oxygen, oxidisers do not retard dissolution. Potassium nitrate, potassium bichromate and potassium chlorate were found to be without influence upon the solubility of gold in KCN Aq.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Ropes at New Modder Circular Shaft.

To the Editor, *South African Mining Journal.*

Sir,—With reference to the article which appeared in your last issue on the subject of the New Modderfontein Circular Shaft, you omitted to mention the fact that the shaft was equipped with Latch & Batchelor's winding and guide ropes. You are, no doubt, aware that the ropes in a shaft are one of the most important features connected with it. Furthermore, the ropes were equipped with the "Reliance" rope cappel, also with Barker's double catch safety hook, all of which are new and up-to-date features in South African mine shaft equipment. It may interest your readers to know that the winding rope which we supplied carried out the complete sinking, which, in addition to the hauling of men and rock, included the lifting and lowering of the men and material in connection with the bricking and the general re-enforcing of the shaft. Although this rope had been in commission for just under two years its condition when dispensed with was described as being perfect, and was only removed because of its being rather on the short side. The guide ropes are still in use and will, we understand, remain so until the new equipment arrives.—Yours, etc.,

BELLAMY & LAMBIE.

Johannesburg, April 8th, 1913.

A Useful Testing Device.

To the Editor, *South African Mining Journal.*

Sir,—In your issue of March 29th last there is mentioned a colour test devised and used on the Brakpan Mines plant for quickly estimating the gold content of the effluent from the Merrill zinc presses. It may be of interest to state that this colour test (which briefly consists in collecting the gold from a bulk sample on a small quantity of lead, somewhat after the manner of the Chiddey assay, dissolving in aqua regia, boiling off the nitrous fumes and adding a mixture of stannous and stannic chlorides) is well known to most Rhodesian cyaniders. The test was in daily use on the zinc boxes tails of the Bell mine at Que Que as far back as 1907. I believe it was first introduced into Rhodesia by Mr. H. Durant some considerable period prior to that date. Personally, I have found the test, if conducted along the lines laid down in the article in your paper a most handy and reliable one, and one that deserves to be even better known than it is at present.—Yours, etc.,

HUXLEY ST. JOHN BROOKS.

Umtali, 5th April, 1913.

The Question of Air Pressures.

To the Editor, *South African Mining Journal.*

Sir,—With reference to your article, "Air Pressures in Witwatersrand Mines," appearing March 22nd, 1913, in your journal, it may well be taken up by the Rhodesian miner. Personally, I am of the same opinion regarding rock drilling with efficient air power to drive these machines, and as economical as possible; with good air, say, from 85-90 lbs., the miner has a better chance of doing better work, and better footage. I consider 60-65 lbs. air very inefficient, as in the first place the blow of the jumper is not strong enough to drill a hole with clearance for the next jumper to follow; it not alone blunts the jumper quicker but stops you from progress, and in some cases the holes are shorter than others, hence bad rounds occurring; the jumper is only fit for use once, the corners are all knocked off, and this makes it impossible for further use. There has been a lot of trouble between the miner and the man in the power house. When the air is bad you ring and ring till you are blue. In not getting any response to air signals, I have come up and found 30, even 40, lbs. registering on gauge, yet the power house in every case logs 80 lbs.; this has been of very frequent occurrence. Trouble has arisen between the miner and drill sharpener: the drill sharpener considers the jumpers are not getting fair treatment, while on the other hand the miner is blaming the air, and the way the drills are sharpened. I prefer the jumpers sharpened with a square face; this I have found to every advantage, both in collaring and drilling much faster, whereas on the other hand with a jumper having a rounded face, I find difficulty in starting and drilling a hole correctly, also the next jumper not following. Particularly is this so when drilling 7-8 feet hole it has often been the case. Say the diamond being used a second time, what with the jambing and low air pressure, and when it comes to the chisel this won't follow, then you use a half-worn chisel, and probably 6 in. to 9in. of use you are compelled to abandon the hole, or chamber it, before rigging up again, which is often the case. Now, with the Ingersoll-Rand hammer drills, if you haven't the full efficiency of air behind them, they give a lot of trouble when the machine rises to the face, and the air is not good. The machine keeps coming down instead of pressing on the face, even when the air is turned on to the full extent, even so the drilling is bad—it takes double the amount of jumpers. I have used as many as nine jumpers for one 3 ft. hole, consequently the miner is not getting through, and not doing what is expected of him. I have used the Holman drill to very good advantage, and must say with 85 lbs. air this drill takes a lot of beating; still it is like the rest, if the air is down one encounters all sorts of difficulties, particularly in Rhodesia, where conveniences are not to hand. It has happened to me scores of times when I have had to leave the machines, and come to the surface, and ask the man in the power house to give the air receiver a "tap" the gas has been that bad from the compressor oil, making everyone ill. I have known on one mine where this used to occur regularly once a week, the miner and all his boys suffering from bad headaches, caused through the gas in the air. I complained to the management on three occasions, and finally an investigation was made, and there were taken 110 gallons of compressor oil out of the air receiver. On another mine the air gave trouble again; one could not get more than 65 lbs. air, the rock being hard to drill, and using 12 holes for cut and round, this used to take three shifts sometimes before the round was down, and heavens knows we did work to get through. I maintain that unless the air registers 85-90 lbs. the work cannot be done as required.—Yours, etc.,

M. S.

Selukwe, March 29th, 1913.

Crown Mines and the Critics.

To the Editor, *South African Mining Journal.*

Sir,—In amplification of my criticisms of Mr. Warriner's Crown Mines *apologia*, I should like to offer further facts. Mr. Warriner says: "Let us examine the costs in June, 1909, and January, 1913. The figures in total are as follows:—Tons milled, June 1909, 137,753; January, 1913, 190,000. Total working costs, June, 1909, £107,160 16s.; January, 1913, £161,218 19s. Cost per ton milled, June, 1909, 15s. 7·2d.; January, 1913, 16s. 11·6d." I beg to amplify the comparison, but take May, 1909, an average month, as a basis for comparison with January, 1913:—Tons milled, May, 1909, 142,520; January, 1913, 190,000. Per cent. sorted, May, 1909, 12·75; January, 1913, 12·87. Grade, May, 1909, 31s. 1d.; January, 1913, 31s. 7d. Cost per ton, May, 1909, 15s.; January, 1913, 17s. Profit per ton, May, 1909, 16s. 6d.; January, 1913, 14s. 2d. (I have ignored decimals and shillings.) Now, sir, it is a fair and reasonable deduction to say the working costs underground per ton in January, 1913, were 3s. 8d. higher than in May, 1909. The 3s. 8d. is made up as follows, based upon Mr. Warriner's own figures:—Saving in surface costs, 1s. 8d.; increased cost, 2s.; total 3s. 8d. The above figures are based upon Chamber of Mines' returns, which are subject to adjustment in detail, but actually represent what was and what is for faithful comparison. Those who have watched the fitful changes in policy since the strike have seen a mining cataclism approaching. That the Crown Mines output for March has taken a splendid forward stride does not alter my outlook one iota. A 2s. improvement in grade and an improvement of 12,000 tons milled has to be improved upon and maintained before present results can be held up as justification for amalgamation. General principles are at fault and the inherent difficulties of underground conditions on the Witwatersrand are not to be overcome by mechanical formulas. The subject is a vastly intricate one and cannot be dealt with broadly and in detail by any one man. But I may briefly sum up my conclusions by asserting that the cause of unsatisfactory results underground are purely practical as distinct from mechanical and scientific. There is probably no industry in the world so splendidly equipped with mechanical plant, scientific brain, and financial resources. Nor, generally speaking, has the Witwatersrand mining industry failed to respond—even if the coping stones to the vast edifice of industry are not slipping smoothly into the grooves, they will yet fit! I am not a shareholder, have no grudge against the industry, do not know Mr. Warriner personally, have no " fish to fry "—I am a wellwisher to South Africa though, and would like to see its great industry prosperous right along the century of years Sir Lionel Phillips tells us there is before the gold mining industry of the Witwatersrand.—Yours, etc.,

UNDERGROUNDER.

April 7th, 1913.

P.S.—I regret an error in my previous letter, where I state that Crown Mines grade in January, 1913, was 3s. better than in June, 1909. It should be the other way about. This fact makes it still more inexplicable why Mr. Warriner seized upon June, 1909, results for his comparison with results in January, 1913. It confirms my remark that " in selecting June, 1909, to make his January, 1913, comparisons with, Mr. Warriner has been singularly unfortunate."—U.

The Position of the Sub Nigel.

To the Editor, *South African Mining Journal.*

Sir,—In your issue of the 22nd ult. you convey a certain amount of satisfactory information to the shareholders of the Sub Nigel Company, and to one who has been a believer in this property for many years, your article is particularly gratifying. At the same time it is the opinion of many of the small shareholders like myself that the disabilities under which the company suffers should not exist. The property is a large one and with the amount of cash working capital you state (£143,000), in addition to 3,000 shares in the Breyten Collieries and 3,100 Knights Deeps (both Consolidated Gold Fields propositions) at the end of June last, there is no reason why a greater proportion of the cash capital of this company should not be applied to the purpose for which it was raised. If the Government have really any regard for the reputation of South Africa, and wish to re-establish confidence in it, it seems to me that they should insist that capital raised for specific purposes should be spent accordingly. In too many instances this rule has been violated by certain financial groups, and the sooner it is put an end to the better. If the working capital of the Sub Nigel had been entirely used for the object for which it was subscribed, the property would have been making as good a profit as many a dividend-paying mine on the Rand. During last month the value of the rock milled by the Sub Nigel Co. was 38s. 10d. per ton, a value which few of the mines on the Rand can boast of. I am aware that working costs on Nigel properties are high, but this is due to want of railway communication, antiquated machinery, primitively constructed shafts, and other disabilities, all of which could be remedied. It would be interesting to shareholders to know why this huge working capital of the Sub Nigel is being hoarded. Is it another instance of the mining industry of the Heidelberg district being throttled by those who, although they carry big holdings in the district, fear the deflection of capital from the mines they control on the Rand? It behoves the Parliamentary Member for Heidelberg to follow the example of the Member for Springs and ascertain if the Government are agreeable to such handicapping of the district which he represents. It is to be sincerely hoped that the working capital of the Sub Nigel has not been invested in Mexico.—Yours, etc.,

SHAREHOLDER.

Heidelberg, 3rd April, 1913.

[We would recommend " Shareholder " to read carefully the speech delivered by the chairman at the last annual meeting of the company, which fully explains the policy of the Board, and the following extract we think should assure him that the policy being pursued is in the best interests of the general body of shareholders. " The incline of E shaft (the westermost shaft) is now being continued in order to intersect the reef which was some time ago located below the dyke by a borehole. This work is being actively prosecuted, and it is estimated that the reef should be encountered in six to eight months' time, the dyke through which the sinking is proceeding being of extremely hard matter. Before it will be possible to decide definitely whether the prospects warrant the starting of a policy of exploitation on an appreciably larger scale than the present, which would entail the sinking of a new vertical shaft below the dyke and the re-arrangement and extension of the existing reduction plant, it is clear that it will be necessary to see what values are obtained after the reef has been intersected in this incline. All, therefore, that can be said at present is that if such values are as encouraging as those already obtained below the dyke in the D shaft, and these D shaft values continue as at present, the extension of operations should be fully justified." To meet the necessary expenditure for the carrying out of this policy the Board, especially in the light of the present-day stringency of the money market, are well advised in keeping an adequate cash reserve; meanwhile the current monthly profits will be available for dividends.—Ed., *S.A.M.J.*]

Jumpers-cum-Treasury.

The following is the result of the joint working of the " Jumpers " and Treasury Mines during last month:—55 stamps, working 25 days, crushed 5,530 tons, yielding 1,639 ozs. fine gold from mill, 644 ozs. fine gold from tailings by cyanide, 350 ozs. fine gold from current slimes, and 412 ozs. fine gold from accumulated slimes; total from all sources, 3,045 ozs. fine gold; value of output, £12,789; joint profit for the month, £1,505; position of joint gold reserve at end of month, 729 ozs. fine gold.

SITUATION WANTED.

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Engineering Notes and News.

Cables for Mines.

Mr. E. Kilburn Scott, A.M.Inst.C.E., M.I.M.E., read a paper before the Association of Mining Electrical Engineers recently on the subject of "Cables for the Shafts of Mines." Among the points discussed by the author, the following received special emphasis:—Cables for shafts of mines differ from those in other situations because the question of weight is such an important factor. In order to reduce the weight the cables should be worked at high tension and insulated accordingly. Although aluminium has not been used for shaft cables there is every reason to suppose that the lighter metal would be found distinctly advantageous. Contrary to the general supposition, aluminium is much stronger from the point of view of supporting its own weight than is copper. All metal work which is continuous from top to bottom of a shaft should be utilised as the earth return. There is nothing in the revised rules against this being done, or, indeed, to say that shaft cables must be armoured. In any event, the cross section of the armour of a high tension cable is likely to be too small to properly earth the low tension underground feeders. Even where it is not convenient to use existing metal work it would be very much cheaper to suspend wire ropes in the shaft for the earth return than to place the same amount of metal round a cable as armour. The marked success which has followed the use of silicious tyre rubber as a mechanical protection on cables subjected to moisture and hard wear and tear points to its being also a very suitable material for cables permanently installed in shafts. Further, as sinking cables must necessarily be insulated with rubber, the addition of tyre rubber in place of specially flexible armouring seems a reasonable proposition. By placing the winch in insets as the shaft descends the length of sinking cable can be limited to that at which cable without armour is feasible. Hitherto casing has always been made of sawn planks, the joints of which are difficult to keep tight. The writer suggests the use of telegraph poles, sawn longitudinally and having the joints between the halves closed by steel hoops. Such casing made in that way should be cheap and easy to erect, and it would form a complete protection to the enclosed cable. Regarding preservatives for casing and cleats, it is pointed out that saccharine impregnated into the wood is the best because it has no action on insulations or metals.

A New Type of Fuse.

Ackley Brake and Supply Company, of 50, Church Street, New York City, U.S.A., are advertising quite extensively throughout South Africa a new type of fuse, which is called the "Monarch Refillable." This fuse has achieved great popularity throughout the United States and the Dominion of Canada, and several of the European countries, chiefly because of its novelty in that it can be refilled by a filler of an amperage and carrying capacity accurately gauged according to the provisions of the National Electrical Code. These fuses are made in all the old types and sizes that have become standardised all over the world, and the construction is so remarkably efficient that this fuse bids fair to become well established throughout the mining districts. The cartridge, or barrel, of the fuse is constructed of a specially prepared fibre which is impervious to moisture or to heat, and therefore retains its original strength under the most impossible conditions. Two clamps are thrust into the barrel at each end, these four clamps holding tight in their flanges the filler, about which is poured a quantity of a certain prepared powder sufficient to fill the barrel, the purpose of which is to suffocate the flame at the moment of arcing, thus obviating the possibility of a fire due to an exploded cartridge or to particles of molten metal. These fuses are manufactured in both the "Knife Blade" and "Ferrule," or "clip spring" type, and their chief recommendations are, of course, their economy and efficiency. The fillers cost only a fraction of a penny each, and may be inserted almost instantaneously so that the facility of refilling recommends them almost as highly as their economy. Ackley Brake and Supply Company are furnishing samples all over South Africa to all who request them, which work is being attended to largely by the British Ackley Brake and Supply Company, of 2 and 3, Norfolk Street, Strand, London, W.C.

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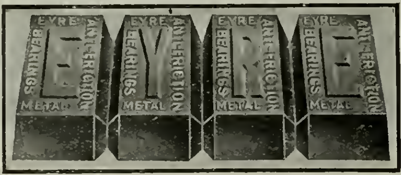

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Finance, Commerce, and Industries.

Standard Bank Dividends.

The half-yearly report of the Standard Bank shows a net profit of £158,920. A dividend of 10 per cent. per annum has been declared, in addition to a bonus of four per cent. per annum; £40,000 have been placed to reserve, £10,000 to the pension account, and £50,238 carried forward.

* * * *

Delagoa Coal Loading Plant.

The conference held in Johannesburg last week between Messrs. Sá and Von Hafe and the representatives of the Union Railway Board and Coalowners' Association resulted in none of the ten tenders submitted a fortnight ago being found acceptable, says the *Lourenco Marques Guardian*. These, it will be remembered, mostly favoured the conveyor system, and the prices varied from £23,250 to £43,118. The principal objection to these tenders, apart from the initial cost and working charges, was that the space required for operation could not be restricted to the section of the wharf occupied by the ship requiring cargo. We understand that the model particularly favoured by the Coalowners' Association would have necessitated the monopolising of a wharf frontage equal to upwards of three times the length of the vessel taking coal. Considering our limited quayage, which when entirely completed, and in the light of the experiences of the past few weeks, will by no means be ample for the accommodation of the number of ships now coming here, this was of course a fatal objection, and one fully realised by the S.A.R. delegates. Of the ten schemes submitted only four of these partially met the required conditions, and these models, again, were considered too complicated, inordinately expensive in first cost, maintenance, and working, as well as, as previously explained, occupying too much space. To meet these difficulties Engineer Von Hafe submitted a plan wherein the McMyler tippler would be embodied. This would be mounted on an especially-constructed foundation on the west side of the end of the Netherlands Pier. Westwards of this again would be driven stout piles to form bollards for mooring steamers so that their forward or after hatch would be in front of the coal hoist. To work the other hatches the vessel would be hauled forward, and thus during the whole process of coaling would never encroach for more than two-thirds of her length on the quay frontage.

* * * *

The Business Outlook.

In moving the adoption of the 52nd annual report of the Capetown Chamber of Commerce at the annual meeting this week, Mr. Jagger, M.L.A., referred at length to trade statistics, and pointed out that the economic position in South Africa was altogether too dependent on minerals, which were a wasting asset. As indicating the prosperity of the country, he mentioned that the largest increase in any one line was in motor cars, which amounted to 56 per cent. on the previous year. He pointed out that more fruit, tea, vegetables, butter, cheese, condensed milk, eggs, hams, bacon, lard, and preserved meat were being imported, which fact brought out clearly the scope there was in the country for closer settlement, because it was to the production of these products that the farmer on a small scale would largely devote his attention. It would be gathered from the figures that the trade of South Africa was in a sound position, and had during the past year been in a flourishing state. The figures, however, showed that no new capital was coming to South Africa. In a new country like this they could not develop their resources as rapidly as they were capable of being developed without capital from outside. A large portion of the capital of the country was being absorbed by Government enterprises. This policy could not be continued much longer, especially as Government proposed spending a further 6½ millions on railways and public works during the ensuing financial year. Proceeding, Mr. Jagger said the drought must have involved the country in a loss amounting to hundreds of thousands of pounds. Consequently they could not expect the same advance this year as last. Farmers in the Western Province had probably had a record year of prosperity. Not only had they had splendid harvests, but owing to the drought in other

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parts of South Africa, and the consequent increased demand for grain and forage, they had got very good prices. Fruit farmers had experienced bad weather, resulting in a largely decreased output, which militated against the export trade. There was little cause for complaint in the wine industry, the demand for Cape wines being so great that the supply was hardly equal to it. Referring to the Post Office Act, Mr. Jagger expressed surprise that the London Committee of South African Merchants should have given support to a project on the part of shipping companies which was entirely contrary to the policy of the Government and the people of this country. With regard to the bunkering trade, he said it did not appear satisfactory that after all the efforts that had been made the business should have fallen practically into the hands of a monopoly. He thought the only way to checkmate the move was to reduce the overland rates on the carriage of coal.

* * * *

Value of Rand Townships.

The following communication has been addressed to Mr. H. J. Hofmeyr, chairman of the Local Government Commission, by Mr. W. H. Mardall, secretary of the Johannesburg Consolidated Investment Co., Ltd.:—"It has been brought to our notice that the representative of the Johannesburg Municipality (Mr. F. A. W. Lucas), in giving evidence before your Commission, submitted a statement setting forth the original purchase price and present value of certain townships, viz., Yeoville, Berea and Doornfontein, the property of this company. We beg to inform you that the figures given by Mr. Lucas as to the original purchase price and present Municipal valuation of the unsold ground are absolutely incorrect. For your guidance we beg to give you the correct figures as appearing in this company's books and as stated by us in evidence before the Leasehold Townships Commission:—Yeoville Estate: Original purchase price £116,273 1s. 8d., Mr. Lucas's figures £5,879 16s. 3d.; M.C.V. at date of unsold ground, correct amount £51,150, Mr. Lucas's figures £101,735. Berea and Doornfontein: Original purchase price £528,695 3s. 5d., Mr. Lucas's figures £45,638; M.C.V. at date of unsold ground, correct amount £157,915, Mr. Lucas's figures £240,775. We may also state that we value our unsold ground in Yeoville at to-day's date at £41,150, and our unsold ground in Berea and Doornfontein at £142,050. We are all the more surprised as Mr. Lucas making such a statement, as he was at one time secretary to the Leasehold Townships Commission, and in that capacity heard the evidence we gave and had access to the very full statements as to the above facts that we submitted to the said Commission. We must apologise for troubling you in this matter, but we cannot help thinking that such flagrant mis-statements, if left uncontradicted, might possibly tend to mislead your Commission and the general public and create prejudice against the township owners. We trust that you will be good enough to give this letter the same publicity that was accorded to the statement submitted by the representative of the Municipality."

New Company Registrations During March.

The following new companies, increases of company, share capital, and notices of liquidations have been registered with the Registrar of Companies at Pretoria during March:—

The Withbank Tailoring Company, Ltd., Main Street, Withbank; registered March 3. Capital, £300.

George Baird and Company, Ltd., No. 200, Commissioner Street, Johannesburg; registered March 5. Capital, £500.

Victor Frolich, Ltd., Erf No. 89, Polgieter Street, Potchefstroom; registered March 7. Capital, £100.

The Dekko Syndicate, Ltd., 28, Green's Buildings, Johannesburg; registered March 7. Capital, £2,000.

Transvaal Investment Company, Ltd., 11, Goodman's Buildings, Commissioner Street, Johannesburg; registered March 8. Capital, £5,000.

De Palmietfontein Syndikaat Beperkt, Elandsknil, No. 110, district Potchefstroom; registered March 10. Capital, £18,000.

Zontpansberg Exploitation Syndicate, Ltd., 37, Stock Exchange Buildings, Fox Street, Johannesburg; registered March 12. Capital, £2,500.

The East Rand Board of Executors and Trust Company, Ltd., Javett's Buildings, 71b, Market Avenue, Benoni; registered March 14. Capital, £100.

Dowjee Company, Ltd., 230, Christoffel Street, Pretoria; registered March 14. Capital, £500.

The Mauss Continuous Centrifugal Separator, Ltd., 13, Commercial Exchange Buildings, Main Street, Johannesburg; registered March 14. Capital, £10,[illegible].

The Apsey Estate Company, Ltd., Trust Buildings, Fox Street, Johannesburg; registered March 14. Capital, £2[illegible].

B. and C. Syndicate, Ltd., Transvaal Bank Buildings, Fox Street, Johannesburg; registered March 15. Capital, £1,000.

Pentecostal Mission, corner Market and Kerk Streets, Johannesburg; registered March 18. Capital, unlimited company.

Colox Paint Company, Ltd., Standard Bank Buildings, Commissioner Street, Johannesburg; registered March 19. Capital, £[illegible].

Jewellers' Association, Ltd., Imperial Buildings, corner of Pritchard and Eloff Streets, Johannesburg; registered March 19. Capital, £2,000.

West Rand Co-operative Society and Stores, Ltd., No. 31, Ockerse Street, Krugersdorp; registered March 25. Capital, £500.

The South African Investment Corporation, Ltd., Reserve Investment Buildings, Johannesburg; registered March 25. Capital, £1,0[illegible].

N. Smith Proprietary, Ltd., Grosvenor Tea Room, Harrison Street, Johannesburg; registered March 25. Capital, £800.

Stella, Limited, National Bank Buildings, Simmonds Street, Johannesburg; registered March 25. Capital, £1,[illegible]0.

The Sandbult Diamond Syndicate, Ltd., Exploration Buildings, Commissioner Street, Johannesburg; registered March 27. Capital, £12,000.

Refractory Ores, Ltd., Bussey Buildings, Commissioner Street, Johannesburg; registered March 29. Capital, £3,500.

The City Trust and Investment Company, Ltd., Marlborough House, Commissioner Street, Johannesburg; registered March 29. Capital, £5,000.

Ventersdorp Lime Works, Ltd., Corporation Buildings, Commissioner Street, Johannesburg; registered March 29. Capital, £2,000.

Barnett's Economic Stores, Ltd., Saltman's Buildings, 19, Main Road Fordsburg; registered March 31. Capital, £2,500.

Transvaalse Landbouwers Arbeids Maatschappij Beperkt, Bethal Landbouw Ko-Operatieve Vereeniging, Plein Street Bethal; registered March 31. Capital, £600.

FOREIGN COMPANIES.

S.A. Construction Company, Ltd., care of William Pott, B. and T. Buildings, Commissioner Street, Johannesburg; registered March 19. Capital, £100,000.

INCREASES OF CAPITAL.

The National Diamond Prospecting and Developing Syndicate, Ltd., Johannesburg; registered March 7, 1913; capital, £30,000, to £70,000.

Tube Mill Patents Consolidated, Ltd., Johannesburg; registered March 12. Capital, £20,000, to £23,000.

The Rietspruit Diamond Syndicate, Ltd., Johannesburg; registered March 19. Capital, £7,000, to £10,000.

The Witwatersrand Co-operative Smelting Works, Ltd., Johannesburg; registered March 22. Capital, £60,567, to £61,746.

NOTICES OF LIQUIDATION.

Shapiro and Harrison, Ltd., Pretoria; voluntary.

Civil Service Club, Ltd., Pretoria; voluntary.

The Colonial Manufacturers' Agency, Ltd., Johannesburg; by order of Court.

The Voorspoed Diamond Mining Company, Ltd., Johannesburg; voluntary.

Monomotapa Concessions, Ltd., Johannesburg; voluntary.

Bonanza Sands, Ltd., Johannesburg; by order of Court.

Empire Theatre Company (S.A.), Ltd., Johannesburg; by order of Court.

The Consolidated Fisheries, Ltd., Johannesburg; voluntary.

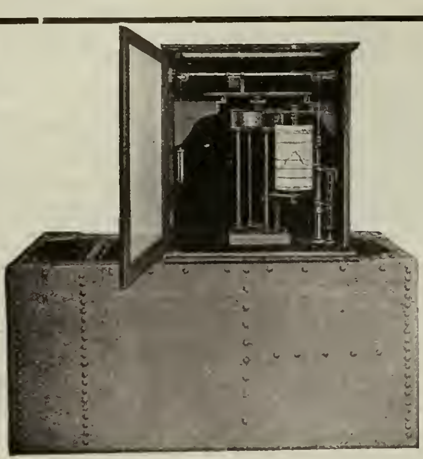
Premier Diamonds.

The seventeenth dividend on preference shares of 125 per cent., or 6s. 3d. per share, for the half year ended April 30 will be payable to all shareholders registered at the close of business on that date.

Trimble's Detective Agency, Limited.

Office: 13, Natal Bank Buildings.

The best, most efficient, and reliable Detective Agency. Telegrams, "Trimbles." P.O. Box 56. Office 'Phone 1927. Residence, 'Phone 711. Address all communications to Andrew Trimble, J.P., Sole Director.



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2. Measurement of steam consumption.
3. Measurement of pump discharges.
4. Measurement of CYANIDE, Oil, Acid or Alkali liquors.
5. Measurement of sewage, streams or supplies to reservoirs.

A TEST WAS CONDUCTED BY THE NATIONAL PHYSICAL LABORATORY ON A "PRECISION" *METER SHOWED AN ERROR OF CONSIDERABLY LESS THAN 1 PER CENT.* PRICES *ARE* LOW. *ASK FOR LIST M/31.*

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340-342, West Street, DURBAN.

10/14 AUSTIN TWO-SEATER.

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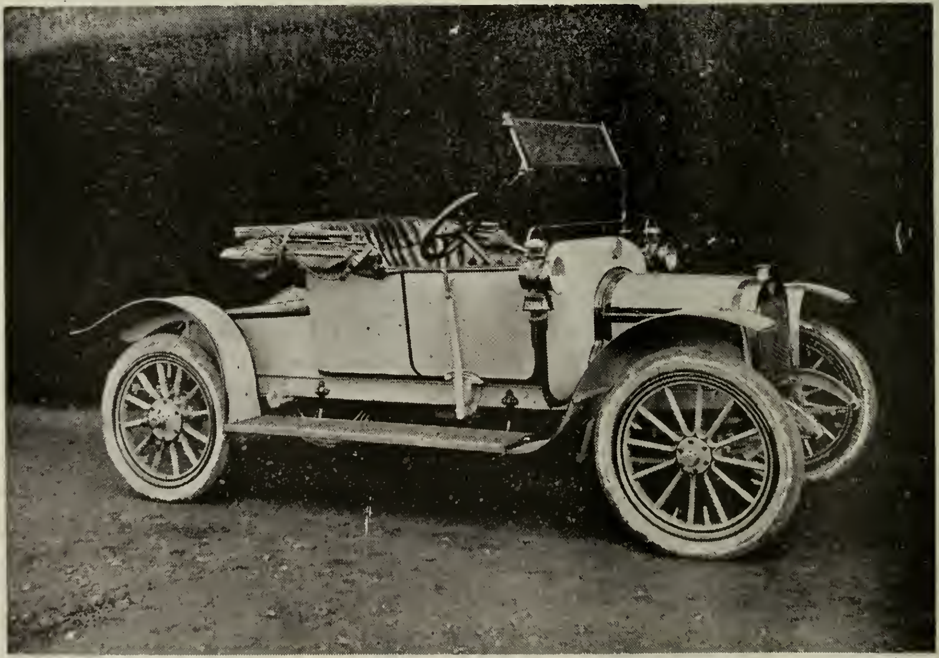


Particulars from **GILL'S GARAGE, Eloff Street, JOHANNESBURG.**

P.O. Box 4659. 'Phone 1505.

Automobile Notes.

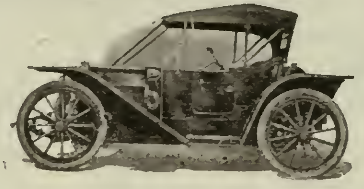
The stealing of motor cars has, according to information supplied by the Automobile Association and Motor Union, been on the increase of late, six cases having been reported during the past month. Several car-locking devices, designed to frustrate predatory attempts, have been placed upon the market. Among the latest is "Hacking Pedal Catch and Car Lock," the objects with which it has been introduced being two-fold; first, it provides a simple means by which the clutch may be held out of engagement for adjusting or dressing the clutch leather; and second, it enables the driver so to leave his car that no unauthorised person shall be able to take it out in his absence. The device consists of a catch hinged to the footboard, which can be brought into engagement with the clutch pedal when depressed and locked in that position with a padlock.

* * * *

The most severe punishment hitherto inflicted on a motorist for careless driving was imposed at the Manchester Assizes recently by Mr. Justice Bailhache. The case was one in which overconfidence on the part of the driver, and hesitation and indecision on the part of the pedestrian, brought about the accident which resulted fatally to the latter. The alleged offence was aggravated by the fact that, according to police and medical evidence, the driver was at the time under the influence of drink. The sentence was one of three years' penal servitude.

* * * *

In a recent County Court inquiry in America in a case of running down by a motor car, it was shown in evidence that the cause of the accident was a defect in the steering gear, and that it might have been prevented by the use of ordinary care and forethought. The following very pointed and sensible remarks were made by the judge in delivering judgment: "The circumstances of street travel at the present time require a much greater degree of care, both on the part of pedestrians and drivers of vehicles, than was required twenty or even ten years ago, and it was almost imperative on the part of the owner of a modern self-propelling vehicle that the steering gear be kept in such condition that the machine shall go where the driver intends it to go. It is useless to say that the accident in this case was unavoidable, because the defendant's own testimony shows that if the nut, bolt or cotter-pin had been inspected that morning, their worn condition would have been discovered, and they



The K-R-I-T Car.

4 Cylinder, 25/30 h.p., BOSCH MAGNETO, ZENITH CARBURETTOR, 3 Speeds and reverse. Gate Change. Full Equipment, hood, screen, 5 Lamps, 5 detachable rims. 5 SEATER, £250. 2 SEATER TORPEDO, £245.

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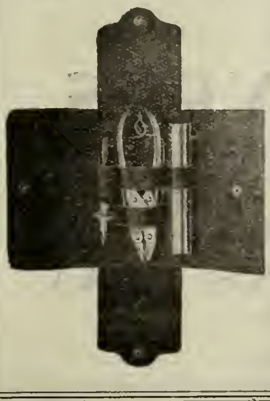
PARSONS PRODUCTIONS

FOR MOTORISTS.

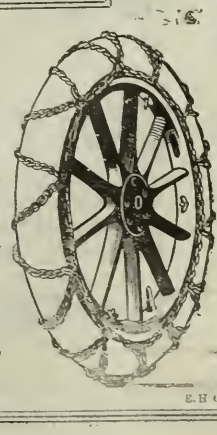
PARSONS RAPID REPAIR KIT

PARSONS NON-SKID CHAINS



Reduces the hitherto long and messy method of puncture repair down to a simple matter of inserting a plug in the puncture and compressing it. Once tight, the plug stays tight—never to leak, creep or come undone. Kit fits the pocket, weighs only one pound; contains twelve plugs and all the tools required.

Add Parsons Non-Skid Chains to your Motor Car equipment and forget what it is to skid or slip. Carry them in your car—ready for instant use. Attached in two minutes detached in one. Parsons Non-Skids will take you over ANY road surface—sand, mud, grass or rock. They cannot damage or heat the tyres, and they give the maximum tractive grip under all conditions.



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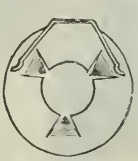

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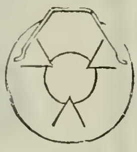

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could easily have been replaced, and if the inspector saw them and took chances, or failed to see them, the fault is with the defendant." Not a few accidents in this country have been ascribed to this cause, or to the failure of the brakes to act in descending dangerous passes. The owners and drivers of vehicles, especially those plying for hire, would do well to carefully consider the remarks quoted above, and to realise fully the responsibility attaching to them in respect of the passengers they carry. A case occurred only quite recently in the South-Western districts in which the driver of a very fine car, practically new, lost command of his machine in descending a steep gradient, through "the brakes failing to act." He turned the car into the bank, from which it rebounded, turning turtle on the road. He escaped with a few trifling injuries—fortunately, there were no passengers—but the owner of the car had a heavy bill to foot before it could take the road again.

* * * *

In the economy of the internal combustion engine, the least thoroughly understood process is that of carburation, and inventors are continually working at the problem and bringing out new devices for effecting improvements in this direction. So many new carburettors are produced that it is impossible to keep track of them all, and only the few that are taken up and fitted by prominent car makers become familiar to the ordinary motorist. Of an ingeniously simple and entirely automatic type, the S.U. carburettor, invented between three and four years ago, has, within the last two years, deservedly made its way into the favour of the best class of motor manufacturers. In the main, it consists of three parts; the body of the carburettor forms the passage for the air which enters at the lower end, and passing the jet on its way, leaves the carburettor at the top, after passing the butterfly throttle. On one side of the main casting is a chamber which contains a bellows, the bottom of which is fastened by a brass disc, to which is fastened a rod that carries on its lower end (inside the air passage) a piston and a tapered needle, which latter projects into the opening of the jet. The interior of the bellows communicates with the mixing chamber by means of a channel, in such a way that a partial vacuum is created inside the bellows by the suction of the engine. When the engine is running idle, the piston almost closes the air passage, leaving only a very narrow opening near the jet. When, through the opening of the throttle, the suction of the engine increases the partial vacuum which is formed inside the bellows—through the channel from the mixing chamber—has the result of closing

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them up, so that the bottom of the bellows begins to rise. This in its turn raises the piston in the air passage, allowing more air to pass, and at the same time withdraws the tapered needle from the jet orifice, admitting more petrol. In this way the amount of air and petrol admitted are so proportioned as to form a perfect mixture at all speeds of the engine. The float chamber differs from the usual pattern only in that it is designed to fit on to the main casting in three different position. In this way the fitting of the carburettor to different types of engine is greatly facilitated.

* * * *

The price of petrol in England now stands at 1s. 9d. per gallon, and is likely to be further advanced in the near future. The time is rapidly approaching when all the petrol manufactured in America and Europe will be required for consumption in the countries producing the crude oil from which it is extracted. England will then practically be dependent entirely on the far East, Sumatra, Borneo and Java, for her requirements, from which countries, at the present time, half of her supplies are drawn. The immense distance over which these have to be carried, would, in the event of war breaking out, virtually isolate Great Britain. It is, therefore, vitally important that the search for alternative fuels should be vigorously prosecuted, and the assistance of the Government in stimulating the search, and providing protection for successful results, is surely a national necessity. Private enterprise is doing a great deal, and what has been called the Petrol Substitutes Committee, a body representative of the whole motoring interests, has now been appointed to go fully into the whole question of alternative fuels. On this newly-appointed body, the R.A.C., the S.M.M.T., the A.A. and M.U., are represented by some of the best known names in the motoring world.

INVESTORS' DIARY.

The following company meetings have been announced:—

April 25.—Worcester Exploration Co. at Worcester, C.P.
May 10.—Roberts Victor.
May 21.—Apex Mines; New Kleinfontein.
May 27.—Transvaal Coal Trust; Brakpan Mines; Springs Mines; New Era Consolidated.
May 29.—Roodepoort United; West Rand Consolidated, Meyer and Charlton; New Goch.
May 30.—Sacke Estates; Aurora West, Cinderella Consolidated, New Steyn Estate; Rand Collieries.
June 3.—Modderfontein B.; Robinson.
June 4.—Rose Deep; Village Deep.
June 5.—Durban Roodepoort Deep; City Deep.
June 6.—Bantjes Consolidated; Geldenhuis Deep; Crown Mines.
June 18.—Rand Mines.
July 15.—Transvaal Consolidated Lands.

Piggs Peak.

The following is the result of operations for the month of March, 1913:—25 stamps ran 27¼ days, crushed 3,033 tons, yielding 535 ozs. fine gold; cyanided 2,690 tons, yielding 389 ozs. fine gold; concentrates shipped, 12 tons, containing 133 ozs. fine gold; total, 1,057 ozs. fine gold, value £4,471; recovered from outside sources, gold value £840; total costs, £2,489, total profit, £2,822.

Phoenix G.M. Co.

At the annual meeting of the Phoenix Gold Mines, held the other day, the Chairman, in moving the adoption of the report, said: "So far a waiting policy has been adopted, hoping that the results obtained from the operations of adjoining companies would serve as a 'pointer' in enabling your directors to decide on a further policy, but the information expected to be gained has not been forthcoming, and pending some encouraging data, it is proposed to husband the cash resources of the company, and by so doing retain the strong position of being able to take immediate advantage of any favourable circumstances that may arise. On perusal of the audited accounts you will observe that the cash assets of the company amount to over £27,000, and our liabilities are practically nil, consequently the position of your company is very sound, more especially as your revenue now covers all expenditure."

Nourse Mines.

The operations at the Nourse Mines for the quarter ended January 31 resulted in a working profit of £65,005 (8s. 6d. per ton). Main Reef, distance exposed 1,200 feet, width 11 ins., assay value 12s. 2d.; Main Reef Leader, distance exposed 1,690 feet, width 11 inches, assay value 51s. 6d.; South Reef, distance exposed 1,440 feet, width 16 ins., assay value 68s. 11d. The total development footage for the quarter was 6,803 feet, a decrease of 729 feet when compared with the previous period. The tonnage of payable ore fully developed for the six months ending January 31, 1913, was 12,900 tons, of an average value of 27s. 9d. per ton. In addition, it is estimated that 168,000 tons of payable ore have been developed, which will be fully valued and credited to ore reserves when completely blocked out. The native labour position, which had been unsatisfactory, improved considerably towards the end of the quarter. The total number of natives in the company's service at January 31 was 1,895, as against 4,285 at the expiration of the previous quarter. The expenditure on equipment for the quarter has amounted to £13,271; the chief item was in connection with the surface ore haulage from No. 2 South Nourse shaft to the mills. A further amount of £9,167 will be required to complete the present capital expenditure authorised.

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Importer of Electrical Supplies for the Trade.
Sole Agent for the "ARCONA" Metal Filament Lamp.
MARSHALL SQUARE, JOHANNESBURG.
ESTABLISHED 1892.

The Tudor Gold Mining Co., Ltd.

(Registered under the Limited Liability Laws of the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Twelfth Ordinary General Meeting of Shareholders in THE TUDOR GOLD MINING COMPANY, LIMITED, will be held in the Board Room, Silesia Buildings, Main Street, Johannesburg, on WEDNESDAY, 28th MAY, 1913, at 10 a.m., for the following purposes, namely :—

1. To receive and consider the Balance Sheet and Revenue and Expenditure Account, together with the Directors' and Auditors' Reports, for the year ended 31st December, 1912.
2. To elect two Directors in place of Messrs. Stephen Cope Black and Amandus Brakhan, who retire by rotation in accordance with the provisions of the Company's Articles of Association, but are eligible and offer themselves for re-election.
3. To appoint Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors, Mr. Charles Stuart and Messrs. F. W. Diamond and English.
4. To transact any business that may be transacted at an Ordinary General Meeting.

The Transfer Books and Register of Members of the Company will be closed from the 21st May to the 11th June, 1913, both days inclusive.

Holders of Bearer Shares in South Africa cannot attend or vote at the Meeting unless such Bearer Shares are deposited at the Head Office of the Company at least twenty-four hours before the time appointed for the Meeting; and, if not resident in South Africa, holders of Bearer Shares must deposit such Bearer Shares at one of the Branch Offices of the Company at least thirty clear days before the time appointed for the Meeting.

By Order of the Board,
W. M. TUDHOPE,
Secretary.

Head Office :
Silesia Buildings, Main Street,
(P.O. Box 1125) Johannesburg,
28th March, 1913.

Princess Estate & Gold Mining Co., LIMITED.

(Registered under the Limited Liability Laws of the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the next Ordinary General Meeting of Shareholders in the PRINCESS ESTATE AND GOLD MINING COMPANY, LIMITED, will be held in the Board Room, Silesia Buildings, Main Street, Johannesburg, on WEDNESDAY, 28th MAY, 1913, at 10.30 a.m., for the following purposes, namely :—

1. To receive and consider the Balance Sheet and Profit and Loss Accounts, together with the Directors' and Auditors' Reports, for the year ended 31st December, 1912.
2. To confirm the appointment of Mr. Fernand Georges Charles Emmanuel Robellaz as a Director of the Company.
3. To elect two Directors in place of Messrs. Clement Davies and John Hall Ryan, who retire by rotation in accordance with the provisions of the Company's Articles of Association, but are eligible and offer themselves for re-election.
4. To appoint Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors, Messrs. C. L. Andersson & Co. and Messrs. F. W. Diamond & English.
5. To transact any business that may be transacted at an Ordinary General Meeting.

The Transfer Books and Register of Members of the Company will be closed from the 21st May to the 11th June, 1913, both days inclusive.

Holders of Bearer Shares in South Africa cannot attend or vote at the Meeting unless such Bearer Shares are deposited at the Head Office of the Company at least twenty-four hours before the time appointed for the Meeting; and, if not resident in South Africa, holders of Bearer Shares must deposit such Bearer Shares at one of the Branch Offices of the Company at least thirty clear days before the time appointed for the Meeting.

By Order of the Board,
W. M. TUDHOPE,
Secretary.

Head Office :
Silesia Buildings, Main Street,
(P.O. Box 1125) Johannesburg,
12th April, 1913.

Van Dyk Proprietary Mines, Limited.

(Registered under the Limited Liability Laws of the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Eighth Ordinary General Meeting of Shareholders in the VAN DYK PROPRIETARY MINES, LIMITED, will be held in the Board Room, Silesia Buildings. Main Street, Johnnesburg, on WEDNESDAY, 28th MAY, 1913, at 10.15 a.m., for the following purposes, namely :—

1. To receive and consider the Balance Sheet and Revenue and Expenditure Account, together with the Directors' and Auditors' Reports, for the year ended 31st December, 1912.
2. To elect two Directors in place of Messrs. Hans Neuhaus and Julius Friedlander, who retire by rotation in accordance with the provisions of the Company's Articles of Association, but are eligible and offer themselves for re-election.
3. To appoint Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors, Messrs. F. W. Diamond and English and Messrs. C. L. Andersson & Co.
4. To transact any business that may be transacted at an Ordinary General Meeting.

The Transfer Books and Register of Members of the Company will be closed from the 21st May to the 11th June, 1913, both days inclusive.

Holders of Bearer Shares in South Africa cannot attend or vote at the Meeting unless such Bearer Shares are deposited at the Head Office of the Company at least twenty-four hours before the time appointed for the Meeting; and, if not resident in South Africa, holders of Bearer Shares must deposit such Bearer Shares at one of the Branch Offices of the Company at least thirty clear days before the time appointed for the Meeting.

By Order of the Board,
W. M. TUDHOPE,
Secretary.

Head Office
Silesia Buildings, Main Street,
(P.O. Box 3524) Johannesburg,
28th March, 1913.

Lancaster West Gold Mining Co., Ltd.

(Registered under the Limited Liability Laws of the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Thirteenth Ordinary General Meeting of Shareholders in the LANCASTER WEST GOLD MINING COMPANY, LIMITED, will be held in the Board Room, Silesia Buildings, Main Street, Johannesburg, on WEDNESDAY, 28th MAY, 1913, at 11 a.m., for the following purposes, namely :—

1. To receive and consider the Balance Sheet and Profit and Loss Account, together with the Directors' and Auditors' Reports, for the year ended 31st December, 1912.
2. To confirm the appointment of Mr. Max Gustav Elkan as Director in place of Mr. Max Francke, who has resigned.
3. To elect two Directors in place of Messrs. William Dalrymple and Eugene Jules Renaud, who retire by rotation in accordance with the provisions of the Company's Articles of Association, but are eligible and offer themselves for re-election.
4. To appoint Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors, Mr. Thomas Douglas and Messrs. F. W. Diamond & English.
5. To transact any business that may be transacted at an Ordinary General Meeting.

The Transfer Books and Register of Members of the Company will be closed from the 21st May to the 11th June, 1913, both days inclusive.

Holders of Bearer Shares in South Africa cannot attend or vote at the Meeting unless such Bearer Shares are deposited at the Head Office of the Company at least twenty-four hours before the time appointed for the Meeting; and, if not resident in South Africa, holders of Bearer Shares must deposit such Bearer Shares at one of the Branch Offices of the Company at least thirty clear days before the time appointed for the Meeting.

By Order of the Board,
W. M. TUDHOPE,
Secretary.

Head Office :
Silesia Buildings, Main Street,
(P.O. Box 1125) Johannesburg,
12th April, 1913.

THE SOUTH AFRICAN
Mining Journal,
WITH WHICH IS INCORPORATED
South African Mines, Commerce and Industries.
ESTABLISHED 1891.

VOL. XXII., PART II.] APRIL 19, 1913. [No. 1125.

HEAD OFFICE: 119-126, Exploration Buildings (3rd Floor).
Telephone **913.** P.O. Boxes **963** and **418.**
Cable and Telegraphic Address: "**MINING JOURNAL.**"

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Notes and News.

The Native Labour Position.

Mr. John Munro reviewed the native labour position at the Chamber of Mines meeting on Thursday, and gave some interesting light on recent recruiting. It appears that on March 31 there were 231,783 natives in the employ of members of the Witwatersrand Native Labour Association, including those employed by mine contractors, but excluding natives employed by members of the Association in Barberton, Breyten and Rooiberg, as against 230,457 employed at the end of February, or a total gain for the month of 1,326 natives. The gold mines show a gain of 71, the coal mines a gain of 132, and the Premier Diamond Mine a gain of 1,123. The Cape Province is mainly responsible for the shortfall of natives recruited in March as compared with February. Although a falling-off is usual at this time of the year, yet the high figure can partly be accounted for by the floods which have recently taken place in the Transkei and Pondoland, preventing natives from coming forward. The total number of natives returning to their homes during the month of March was 19,065, which can be considered a high figure for this time of the year. Natives from tropical areas have to arrive on the Rand between August 1 and March 31 inclusive. The total number brought here for the season just passed was 17,514, as compared with 15,640 for the season 1911-12. This shows a gain of 1,874 natives from tropical areas, of which Portuguese Nyassaland is responsible for 1,800.

* * * *

Tube Mills at Barnato Mines.

A feature of the reports of the subsidiaries of the Johannesburg Consolidated Investment Company now before us is the reference to improved results secured and anticipated at two or three plants through the use of tube mills. Without in any way casting a shade of reflection on the excellent management of the Barnato Mines, we may be permitted to remark that in the past this group has been content to adopt new metallurgical and mechanical devices after they have been proved to be successful by other Houses rather than experiment in new metallurgical fields, and no doubt in pursuance of this policy the wholesale adoption of tube mills was for long postponed by the technical advisers of the Johannesburg Consolidated Investment Company. This House can now, however, point to possessing the largest number of tube mills for a 90-stamp battery on the Witwatersrand. We refer to the Consolidated Langlaagte, and may remark that the Van Ryn Deep will possess a precisely similar equipment. At the Ginsberg the improved profit for last year largely is attributable to the use of a tube mill, whilst the New Unified Company's residues have been lowered from ·675 dwt. to ·297 dwt. through employment of a fine grinding machine. The New Primrose Company's tube mill plant recently came into use, and substantial economies are confidently anticipated through its employment. Having regard to all this, it is to be expected that when construction work on the Modderfontein Government Gold Mining Areas is commenced tube mills will constitute a very important feature of the designs of that proposition.

* * * *

A New Detachable Bit.

The inconvenience of carrying many hundred pounds weight of steel up and down a shaft during the course of a single shift, which is one of the disadvantages of machine stoping and driving, together with the attendant expense and waste of the sharpening process, has for a long time past engaged the attention of inventors. Detachable bits of various forms have been devised, but as far as we are aware nothing quite satisfactory in this direction has been introduced to this market. Among the latest inventions is one by Mr. James West, formerly manager of the Crown Diamond Mine, and well known at De Beers and the Premier. The special feature of his detachable bit is its tendency to tighten its hold upon the steel drill as work progresses, and thus to form a rigid connection, which is easily loosened, however, when the tool is withdrawn. This is effected by the double wedge-shaped form of the bit, which slides into its groove sideways and upwards. A combined movement in both directions helps to tighten the bit, and the piece is so shaped that in every blow a part of the force of reaction is resolved in such a way as to maintain the tendency to move in these directions. The invention is distinctly ingenious.

* * * *

Shaft Sinking Charges at the State Mines.

In view of the recent discussion regarding the relative advantages and disadvantages of circular and rectangular shafts and the costs of sinking, it is of much interest to note in the tabulated statement accompanying the report of Mr. F. Graham Bell, manager of the Government Gold Mining Areas (Modderfontein) the costs of sinking at the four shafts of that company last year. The costs embrace sinking, timbering, equipment and baling. At the north-east shaft 1,013 feet were sunk during the year at an average cost of £35 19s. 10d. per foot. The largest amount sunk in any one month was in February, when 158 feet were achieved. The north-west shaft was sunk 929 feet at a cost of £29 17s. 4d. per foot, the maximum footage being in January, when 184 feet were sunk. As to the southern shafts the south-east was sunk 1,691 feet at a cost of £32 3s. 8d. per foot, and the south-west 2,056 feet at £27 1s. 5d. An amount of £3,978 was spent at the north-west shaft and £2,571 at the north-east for timbering, equipment, baling, electric cables and air columns after sinking was completed.

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"S.A.M.J." Index.

The index to Vol. XXII., Part I., of the *South African Mining Journal*, covering the period from September 7th, 1912, to March 1st, 1913, is inserted in to-day's issue.

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An Important Vacancy.

The governing body of the Imperial College of Science and Technology will shortly proceed to the appointment of a Professor of Metallurgy in succession to Professor Carlyle, who vacates the Chair at the close of the present Session, to resume the active practice of his profession; and it is now prepared to receive applications for the post. The Department of Metallurgy, over which the new professor will preside, forms part of the Royal School of Mines—an integral part of the Imperial College. This change takes place at a most important point in the history of the Royal School of Mines, for it will be coincident with the complete occupation of the new building for that school, which the Governors have been enabled to provide by the munificent generosity of private benefactors, notably of the firm of Messrs. Wernher, Beit and Co., of the late Alfred Beit, Esq., and the late Sir Julius Wernher. The roll of the Professors of Metallurgy in the Royal School of Mines for the past sixty years is a very distinguished one, including John Percy, M.D., F.R.S. (1851-79), Sir W. C. Roberts-Austen, K.C.B., D.C.L., F.R.S., and W. Gowland, A.R.S.M., F.R.S. (1902-09). Further particulars as to the appointment may be obtained from the Rector of the College, South Kensington

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General Mining Group.

Though it is not possible to include a lengthy review of the annual reports of the Albu companies in this issue, a brief account of the chief features may be of interest. The Aurora profit is £41,077, as compared with £29,403 in 1911, and in view of the greatly improved returns and the large accession to the ore reserves, the directors anticipate being able, on the disappearance of the political unrest in Europe, to submit a project for the capitalisation of the debt of £156,112, at present due to the General Mining and Finance Corporation, Ltd., for advances. The gross profit of £200,387 earned by the Meyer and Charlton is far in excess of any previous record of the mine, and with the considerable increase in the value of the ore reserves (1·90 dwt. per ton) affords practical evidence of the value of the additional claims acquired a few years ago. A drop of 3s. 9d. per ton in the recovery value of the ore milled is responsible for the decreased profit shown by the New Goch, but as the lower levels are now opening up ore of a higher value than the average grade of the existing ore reserves, the directors anticipate improved results in the current year. The Steyn Estate directors state that owing to the political complications there has been no opportunity for raising the requisite funds on satisfactory terms, and the initiation of active operations on the extensive claim area is still postponed. At Roodepoort United the decreased profit is due mainly to the lower average grade of ore milled, but it is pointed out that drives between the Kimberley main and east shafts are now exposing South Reef of very satisfactory value. Operations at the Rand Collieries have been restricted to the sinking of the east incline shaft, and at the close of the year a crosscut from the horizon of the 10th level had reached a point within 200 ft. of the reef. The outstanding feature of the West Rand Consolidated has been the excellent results obtained from development on the Battery reef. The working profits rose to £74,704, as against £48,904 in 1911. The directors' report of West Rand Consolidated Mines states that the gross profits for the year was £86,235. This, with the amount brought forward, gives a total credit of £148,621. Cash and liquid assets, after deducting current liabilities, at December 31 last totalled £263,277. The mill of 100 stamps, with tube mills, crushed 334,420 tons, yielding gold to the value of £455,992 (27s. 3d. per ton); working expenditure amounted to £381,288 (22s. 9d. per ton), leaving a profit from mining operations of £74,704 (4s. 5d. per ton). The payable ore reserves are estimated at 1,116,733 tons, averaging 6·02 dwts. over 49·5 in. To this may be added 120,467 tons of payable rock, the final valuation of which it not yet available. In addition there are 206,175 tons of ore partially developed, for a large proportion of which an average mine grade is indicated. The appreciable increase in the working profits from £48,905 in 1911 to £74,704 for 1912 is chiefly due to the higher average yield of ore treated, resulting partly from an improvement in mine values, and to some extent to the increased percentage of waste rock sorted. The outstanding feature of the past year's operations underground is the excellent results, both as to width and values, obtained from development on the Battery reef. At the Cinderella, a gross profit of £32,875 was earned, but it is clear that the mine is still passing through a difficult time.

* * * *

The Mines and the Water Question.

The refusal of the Union Government to afford any relief to the Rand in regard to the water supply is still the general topic. From the mining point of view the position was very briefly described by the President of the Chamber of Mines on Thursday. He said, *inter alia*: "I do not wish in any way to exaggerate the effects of the shortage of water on the Rand for domestic and industrial purposes, because I learn that owing to possible increased supplies from the Board's Zuurbekom wells, there will probably be a considerably greater quantity available from this source this dry season as compared with that of last year; on the other hand, in consequence of the low rainfall during the season now closing, there is no doubt that the private supply of the mines for industrial purposes is considerably lower than is usual at this time of the year. I observe from this morning's papers that the engineer of the Board urges consumers to exercise great care and economy in the use of water. This matter has received the most careful consideration of all the engineers on the Rand, and every effort is being made to prevent the stoppage of any of the mines for want of water."

* * * *

Resumption of Work at Crown Diamonds.

Arrangements have been made for the recommencement of work at the Crown Diamond Mine. It is considered that with the increased price of diamonds now ruling there is every reason for mining work to be conducted with a profit. The mine is being unwatered, alterations and renovations are being made to the gear, and preparations are being made for the resumption of washing operations. The necessary financial arrangements to carry out the work have been made with Messrs. Lewis & Marks, who have agreed to advance the necessary funds to the company, without any conditions whatever, except the ordinary rate of interest. The company's accounts will be made up, as in previous years, to the 30th June next, by which time it is hoped that washing operations will have recommenced.

* * * *

Kumst Diamonds.

The flotation of a new company in London which will take over the assets of the Kumst Diamonds, Ltd., has been arranged for. The nominal capital will be £125,000, of which £40,000 will be working capital, 10,000 shares of £1 each will be held in reserve, and 40,000 shares go to the syndicate. The 40,000 shares of £1 each will be exchanged for the 80,000 half-crown shares of the syndicate the exchange, therefore, being on a 4 to 1 basis. Mr. W. Wilkinson, of Messrs. Craig & Wilkinson, has joined the Board as chairman. Among the recent finds is a rather small diamond of a remarkably clear blue colour, a discovery which is something of a rarity in the history of precious gems. We are quite in the dark as to the reasons that justify the re-flotation in London, with such a large capital, of a concern that is understood to be still in the unproved, syndicate stage.

* * * *

Consolidated Mines' Selection.

The accounts submitted by the Consolidated Mines' Selection for 1912 show a profit of £80,873 3s. 4d., including £11,596 18s. 10d. brought forward from last year. The directors recommend that a dividend of 10 per cent. or £55,250 (free of tax) be paid, and that the sum of £15,000 be placed to reserve account, leaving a balance of £10,623 3s. 4d. to be carried forward. The company's financial position has again been materially strengthened, the cash and cash assets exceeding the current liabilities by £225 256 4s. 9d. Properties and unquoted securities stand in the books at £62,800 17s. 6d., and quoted securities taken at cost or under, but in no case higher than the market price at 31st December, 1912, amount to £460,816 1s. 1d.—£523,616 18s. 7d. It is satisfactory to note that at the prices ruling at 31st December, 1912, these assets show in the aggregate a very material appreciation over and above the figures given. The net profit for the year ending 31st December, 1912, amounts to £69,276 4s. 6d., arrived at as follows:—Net profits realised on sales, commissions, etc., £21,953 6s. 1d.; interest and dividends, £65,939 11s. 3d.; transfer fees, £235 9s. 6d.; profit on own debentures purchased, £851 12s. 6d.—£88,979 19s. 4d. Against which have been written off:—Expenses, etc., £11,317 18s.; debenture interest, £6,139 16s. 11d.; cost of investigations, claim licences, and depreciation of office furniture, £1,699 9s. 7d.; income tax, £546 10s. 4d., £19,703 14s. 10d.—£69,276 4s. 6d., which, with the credit balance from last year of £11,596 18s. 10d., gives a total available profit of £80,873 3s. 4d.

* * * *

Rand Progress.

In the course of the Consolidated Mines Selection report it is stated that a review of the operations on the Witwatersrand for the year 1912 shows that the industry has again made a creditable advance. This can be said not only with regard to the results of operations obtained, but also in respect of the present position of the various mining companies, both from a mining and financial point of view. Distributions of dividends of £7,952,994 show an improvement of £189,908 as compared with those of 1911. The fact that they have not advanced proportionately to working profits is accounted for by the partial utilisation of profits for financing additions and alterations to plant, excess development, and other objects commonly regarded as capital charges. This policy was largely a forced one, arising out of the difficulty experienced in raising fresh capital, but in the end it will doubtless prove of advantage to shareholders, as the present position of the various mining companies is probably the soundest in their history. The tonnage milled on the Rand was 25,486,361, yielding gold amounting to £37,182,795—as compared with 23,991,284 tons and £33,519,008 for 1911.

TOPICS OF THE WEEK.

THE ADMINISTRATOR ON MINING.

THE speech made by the Administrator of the Transvaal, Mr. Johann Rissik, at the opening of the Mining Exhibition on Wednesday, was good as far as it went. To sum it up in a sentence, Mr. Rissik said mining in the Transvaal was only in its infancy, that the Province possessed enormous undeveloped deposits of base metals and coal, and that, with the aid of the metallurgists, our pig-iron industry would one day astonish the world. There is a great temptation to feel thankful for this small mercy, to accept Mr. Rissik's graceful tribute as a tardy but none the less welcome admission from the Government that mining is not, after all, a mere passing, " perishing industry," and to leave it at that. But it cannot be forgotten that the Administrator is the representative amongst us of a Government that continues to act as though such views as those propounded by him had never even entered its head. Thus, if the Union Government believed with Mr. Rissik that we were only at the beginning of mining in the Transvaal, how could it ever logically justify its present policy of protecting and fostering every petty interest, manufacturer and unpayable railway line at the Coast, at the direct and indirect expense of the mining industry? Again, if mining has the future which Mr. Rissik, with Sir Lionel Phillips, predicts for it, why is not a penny voted for aid to the prospector and " small man," to whom, in the natural order of things, we must look for new discoveries? Again, why if, as Mr. Rissik says, the coal resources of the Transvaal are to prove its industrial salvation, does not the Government stir an inch—to be exact, reduce railway rates a shilling per ton—to capture the enormous export trade now going a-begging at our very doors? But the whole position is too ridiculous, and it seems waste of energy to rub it in. At any rate, the Administrator owes it to himself to enlighten us. Are we to understand from his speech that the policy of the Union Government towards the mineral development of the Transvaal is repugnant to him? Or are we to understand that his speech is a mere polite form of lip-service to the ideals he knows are cherished by every progressive industrialist in the Province? In either event, the speech is singularly unsatisfactory because incomplete, and leaves us wondering more than ever whether the spokesmen of the Government really believe we are deceived by all the high-falutin' inconsistencies with which they are so fond of soft-soaping us.

THE SECOND MINING EXHIBITION.

THE second Mining Exhibition, promoted by the Chemical, Metallurgical and Mining Society, and opened by the Administrator of the Transvaal, marks an important step in the giving of publicity to the increasing application of science to the industry. The most obvious value of the exhibition is its efficacy in bringing together in a little room many examples, models and full-size, of modern mechanical appliances and devices employed on the mines. Such exhibits are, of course, always available to those interested by a visit to the various store and showrooms of the firms handling them on the Rand. But to the general public, who would never think of embarking on such a tour of inspection, and possibly to students who might lack the necessary iniative and energy, the exhibition should, from this point of view, prove full of interest and instruction. The exhibition has, of course, other claims for consideration hardly less important. In life-saving and ambulance devices it provides a compact and useful object lesson, and this feature is, perhaps, from the practical point of view, its outstanding one. Now that the excellent work of the St. John Ambulance people is becoming familiar on the Rand, and the growing numbers of first-aiders are recognising the necessity of being brigaded into serviceable corps, ambulance and first-aid appliances must become of increasing use on the Rand. The exhibits under this head will be found both interesting and instructive. We are less certain regarding the display of inventions and new ideas about which such a pother has been raised in the lay Press. For the life of us we cannot see how any good can come out of the casual inspection by undetermined thousands of the public of inventions whose merit in nine cases out of ten lies in the fact that they are improvements on some device now in use. If a Mines Trials Committee, drawn from the keenest specialists in the industry, failed wholly to satisfy the local inventor that his idea would have a fair and square trial, an appeal to *hoi polloi* is scarcely likely to prove more effective. This section of the exhibition has at least the merit of being interesting to the mere novelty hunting sight-seer, who is prepared to take the inventor's word for the novelty, and it may have some definite value in stimulating others to go one better. But further than that we cannot go with the enthusiasts of the daily Press. Even if it did nothing else, the exhibition would have served a useful purpose if it succeeded in awakening the great, unthinking general public to the absorbing interest and manifold complexities of modern mining as practised on the Rand. That pure science has played a part no less important than that of capital in the success of the industry is often forgotten where it ought not to be. That oversight, with others, the exhibition will help to correct. A feature of the exhibition fraught with great possibilities of usefulness is the display of raw materials of industry drawn from the country. We should like to see the Government adopt this idea and turn it into a permanent and accessible object lesson in the industrial potentialities of all South Africa. It only remains for us to endorse the cordial tribute paid by Mr. W. R. Dowling, the President of the Society, to Mr. F. Rowland, the Secretary, to whose unflagging efforts and enthusiasm the success of the exhibition is mainly due.

NEW MINING REGULATIONS.

The many proposed amendments and additions to the Mines and Works Regulations submitted by the Government for the suggestions of the Chamber of Mines were discussed by the President of the Chamber, Mr. John Munro, at the monthly meeting on Thursday. Mr. Munro mentioned that the alterations are not confined to any particular section of the regulations, but range practically over the whole of them. Committees of the Chamber, the consulting engineers, the Association of Mine Managers, and the Institute of Certificated Mechanical Engineers have considered the amendments, and have agreed on various recommendations which will be submitted to the Government Mining Engineer for his consideration. Mr. Munro made it clear that the principle actuating the Chamber in considering these proposed amendments and additions is, as was the case in considering the original regulations themselves, to render such alterations as are necessary in the interests of safety and health as effective as possible. Mr. Munro rightly dwelt on the fact that there is a danger of burying important and essential regulations among such a number of regulations that are unimportant that their effectiveness is reduced; and mining officials, to say nothing of miners and natives, are human, and no regulations can ever entirely remove the limitations due to that fact. The problem of securing the maximum effectiveness of regulations is clearly one of great difficulty; it cannot be secured by their endless multiplication. The Chamber's suggestions are not submitted with a view to belittling the proposals which have been put forward, but in order to bring to bear on the proposals the results of the experience of those actively engaged in the conduct of mining operations. It is hoped in this way that real help in securing the practicability and efficiency of regulations may be given to the authorities who are ultimately responsible for issuing them. "That principle," said Mr. Munro, "actuated the Chamber in the past, and I feel confident that its recommendations on this occasion will receive not only full but sympathetic consideration. We are all anxious to see our underground workings as healthy and as safe as it is possible to make them, and we trust that that feeling of co-operation which has existed in the past between the Government and the Chamber will be continued."

WHITE LABOUR AND THE MINING INDUSTRY.

There is no secret about the attitude of the mining industry towards what is known as the white labour question. Recently Mr. J. G. Lawn, on behalf of the gold and coal mining industries, was deputed to give evidence before the Select Committee now sitting in Capetown. The Chamber of Mines has submitted evidence before various Commissions and Committees on this subject in the past, and, on this occasion, the main purport of the evidence submitted was to show the loss this country would sustain if, owing to any arbitrary restriction of the present supply of unskilled labour for these fields, various mines should find it impossible to continue working without loss. The question of the substitution of unskilled Europeans for the whole or any part of the coloured labour force on these fields depends on two sets of conditions—social and economic. The evidence of the Chamber, while indicating the difficulties of the question from a social point of view, did not dwell on them, but dealt with the subject entirely from the economic standpoint. At the Chamber of Mines meeting on Thursday, Mr. John Munro gave some details of the evidence led. He said that in order to present a concrete case to the Committee it was necessary to frame definite estimates. As a basis for calculation it was assumed that two white men could do the work of three natives. This, of course, can only be at best a rough comparison, and it was clearly pointed out that the East Coast natives have now gained such experience on these fields that in ordinary underground work two unskilled white men could not do the work of three East Coast natives. Assuming, however, the basis of two to three, it was pointed out that if the mines were not to be penalised then it would only be possible to pay unskilled white men 4s. 9d. a shift. If the wages of white men replacing natives were taken at higher figures, then the mines would be penalised in proportion, and those working on a small margin would cease to make a profit. Figures were submitted showing the effects of a complete substitution of white labour for black, and also the effects of a partial substitution. It was further pointed out that to restrict the importation of natives from Portuguese East Africa would be striking at the most efficient portion of the native labour force on these fields, and would very seriously interfere with the profit-earning capacity of all our mines, with the result that the low grade mines would cease to make any profit at all. Mr. Munro went on to show that though a low grade mine may mean very little to the shareholders, as long as it is kept working it is just as valuable to the country as a rich mine of the same size, as it depends as much on labour and stores and pays just as high wages as a rich mine. The loss is shown in the evidence that this country would sustain if the Legislature makes the working conditions of these mines on the borderland of prosperity impossible. Further, the great advantages as regards prolonging the life of the mining industry are pointed out if the working conditions were such that large bodies of low grade ore, which are known to exist on these fields, could be worked at a profit. The Select Committee has not yet concluded its deliberations, and therefore it is impossible to foretell its recommendations, but, in due course, its report will doubtless be made public for general information. We are indebted to the President of the Chamber of Mines for his summary of the case for the mines, which it will be seen covers very familiar and indisputable ground.

TIN DRESSING AT THE ROOIBERG.

The Plant Exceeding Expectations—Excellent Extraction Returns—Brief Description of the Flow Scheme.

The discussion which has taken place recently in London with regard to the losses incurred in the dressing of tin ores in Cornwall makes it a matter of great interest at the present time to refer to the excellent work which is now being carried out, at the Rooiberg Tin Mines in the Transvaal, with the object of reducing these losses to a minimum. The dressing plant at this mine was only designed after a very careful study of all the local conditions had been made, and as a result of this careful adaptation of the plant to local conditions, the results obtained to date have not only fulfilled the anticipations formed with regard to the plant, but have to some degree even exceeded them. Judging from the statements made with regard to the treatment of tin ores in Cornwall, and from the design of the dressing plants there in vogue, one might quite reasonably be led to the conclusion that the process of tin mining was at best a haphazard sort of business, which could only be controlled within somewhat wide limits. That this is not so, however, the records of those mills, where a systematic enquiry has been instituted into all the prevailing circumstances and where the plants have been devised to meet these circumstances as closely as possible, clearly prove; as the results obtained at such mills not only clearly show that cassiterite is as amenable to intelligent treatment as any other ore, and that there is little or no excuse for the ill-directed methods, which till recently have passed muster among the tin mines in the Duchy. The works at the Rooiberg tin mine provide an admirable example of what can be achieved by the application of scientific principles in a proper manner; and a discussion of what can be done in this way would, if inaugurated at the meetings of the Institution of Mining and Metallurgy, be probably more fruitful of good than any amount of criticism of what are admittedly antiquated and inadequate methods.

Extraction at the Rooiberg.

For the year ended the 30th June, 1912, the extraction averaged 57·97 per cent., and as the mill pulp averaged 4·94 per cent. metallic tin it will be seen that the residue amounted to 2·08 per cent. metallic tin, or to 42·03 per cent. of the total tin contents of the ore. This result was obtained almost entirely with the old plant, which for the above year milled 18,295 tons as against 1,718 tons ex mine and 789 tons of accumulated middlings and slimes from the old mill treated by the new plant. The residue from the new plant is as low as 0·6 per cent. metallic tin, which, on a milling value of 4·94 per cent., is equal to an extraction of 87·85 per cent., or 29·88 per cent. higher than the extraction obtained with the old plant. It is hoped that, after certain adjustments which are now being made are completed, a residue as low as 0·3 per cent. metallic tin may be obtained, giving a recovery, on the same basis as above, of 93·93 per cent., say, 94 per cent. This, on ore containing as above, 4·94 per cent. metallic tin, is equivalent to a return of 132 lbs. of concentrates per ton as against 82 lbs. of concentrates per ton milled with the old plant, the concentrates in each case carrying 70 per cent. of tin. In pounds sterling per ton treated, the recovery would then be equal to £5·17 in the former case and £8·32 in the latter case. These figures are based on a price of £200 per short ton for metallic tin, less 10 per cent. realisation charges. It will, therefore, be obvious that the erection of the new plant has effected a vast improvement in the prospects of the company from the financial point of view. Previously, it may be added, there was no process of slime treatment in use; now from 15 to 20 tons of concentrates are obtained from this source, a quantity which alone carries enough tin to pay 15 per cent. dividend with a good deal to spare.

Further Improvements.

Further research is now being carried out with regard to the dressing plant in order to improve on, if possible, the present most satisfactory results. An account of this work will probably be available in about three or four months' time, and should prove unusually interesting to engineers and metallurgists.

The Plant Described.

The plant may be thus briefly described. There are 10 stamps of a falling weight of 2,000 lbs. crushing through battery screening of 64 mesh. After passing an automatic sampler the battery pulp flows to a Callow screen fitted with 400 mesh screening. The coarse product from this screen flows to two three-compartment Hartz jigs. The heads from these jigs, after further treatment, go to a Brunton calciner, the middlings and tailings to a tube mill. The underflow from the Callow screen is pumped to six classifiers, the underflow from which passes to six Wilfley tables, whilst the overflow goes to the slime plant. The Wilfley tables separate their feed into three grades, heads, middlings and tailings. The heads, after further treatment, go to the calciner, the middlings join the Hartz jig middlings and tailings and go to the tube mill and the tailings go to waste. The re-ground product from the tube mill is pumped to six classifiers, the underflow from which goes to another series of six Wilfley tables and the overflow to the slime plant. The heads from these six tables, after further treatment, go to the calciner, the middlings to five Frue Vanners, and the tailings to waste. The Frue Vanners separate their feed into heads and tailings, of which the heads, after further treatment, go to the calciner and the tailings to waste. It will thus be seen that everything except the slime is finally dealt with on the Frue Vanners. The slime from the 12 classifiers is divided between three sets of rag frames, consisting of 42 frames in all, from which, after passing through the necessary dewatering cones, it flows to six revolving tables and two Acme tables. The heads from these tables go to slime pits, from which they are taken, and, after further treatment, pass to the calciner, whilst the tailings go to waste. Finally, there are dolly tubs, buddles, and a magnetic separator.

Government Contribution to Phthisis Fund.

In the House of Assembly this week, Mr. Creswell (Jeppe) asked the Minister of Mines: (1) What were the names of the mines in respect of which a portion of the contribution to the Miners' Phthisis Compensation Fund had to be met from the Government contribution in the period ended February 1, under Sections 5 (2) and 7 (2) of Act 19 of 1912; and (2) what was the amount in each case drawn from the Government contribution to make up the full amount of the levy. Replying, the Minister of Mines said that the names of the mines in respect of which the Board's levies had exceeded the quarterly profits and the amounts drawn from the Government contribution account were as follows:—Benoni Consolidated, £493 9s. 2d.; Jubilee G.M. Co., £130 6s. 11d.; Jupiter G.M. Co., £2,516 1s. 10d.; Lancaster West G.M. Co., £1,468 18s. 6d.; Midas Deep, £13 17s. 2d.; New Rietfontein Estates, £1,410 17s. 9d.; Princess Estates, £1,369 2s. 3d.; Simmer Deep, £788 18s. 7d.; Salisbury G.M. Co., £169 8s. 11d.; Simmer and Jack East, £2,189 14s. 8d.; Vogelstruis Estates, £692 17s. 10d.; York G.M. Co., £56 11s. 10d.; Sub-Nigel, £446 5s. 3d.; Ariston Mines, £55 8s. 8d.; New West Bonanza, £99 16s. 4d.; Warren Hill Syndicate, £135 15s. 4d.; New Heidelberg-Roodepoort, £27 14s. 4d.; total, £12,065 5s. 4d.

THE WORLD'S LEADING GOLD MINES.

The Rand's Pre-eminence—Main Reef Propositions Easily First.

The overwhelming pre-eminence of the Witwatersrand in the list of the world's leading gold mining fields, and the predominance of individual Main Reef mines over individual propositions of any other field are well exhibited in the crushing returns of the principal auriferous propositions of the globe for the month of February last. The three leading producers of the Rand—Crown Mines, East Rand Proprietary, and Randfontein Central—each of which yielded over £200,000, easily outdistance the records of companies in other portions of the world for which returns are available. Indeed, not only has the Witwatersrand the three leading mines, but for a considerable way down the list of the British-owned gold mines of the world Rand outcrops and deep levels hold pride of place. In so far as British-owned gold mines are concerned one has to look down the list until the sixteenth name is encountered before meeting with a mine not situated on the Witwatersrand. Excluding the Gold Field Consolidated, the Homestake, and one or two other properties, either in Alaska, the United States, or Mexico, and which are controlled by American capital, the Mysore mine, in the Kolar gold fields of India, and managed by the well-known firm of the Taylors, appears at present to be the leading British gold mine of the world apart from the Main Reef series. The Mysore declared an output of 20,416 ozs. in December, 19,516 ozs. in January, and 18,328 ozs. in February. We believe that it is not the practice amongst Indian mines to declare production in terms of fine ozs. but in bullion, so that the value of the Mysore Company's February output may be placed at approximately £70,000. Rand companies announcing a larger output than this in February were the Crown Mines, Randfontein Central, East Rand Proprietary, Ferreira Deep, Robinson, New Modderfontein, Rose Deep, Brakpan, Nourse Mines, City Deep, Geldenhuis Deep, Simmer and Jack, Knights Deep, and Robinson Deep. Another mine by reason of its aggregate declared production qualifies for inclusion in this list. This is the Mount Morgan mine in Queensland, which for February announced an output worth £83,849. It should, however, be borne in mind that the Mount Morgan is not purely a gold mine. The February return was made up of 708 tons of copper and 9,831 ozs. of gold, so that, strictly speaking, the Mount Morgan, once a producer of the precious metal only, is not now to be included in a list of gold mines such as those mentioned in the foregoing, which are gold mines pure and simple. Following the list down we find the Modder B., Consolidated Langlaagte, Van Ryn, Witwatersrand, City and Suburban, Great Boulder Proprietary, West Rand Consolidated, and Ashanti Gold Fields each contributed over £40,000 to the gold output of the two hemispheres in February. The inclusion of the Ashanti Gold Fields in the list as being the sole representative of the disappointing West Coast is worthy of note. Above the £40,000 standard, too, we find the Great Cobar—another mixed gold and base metal proposition—which had a production of £17,000 to its credit, but as in the case of the Mount Morgan, it is debateable whether this name should, in strict accordance with things, be included in the list. The result of the little enquiry we have instituted into the relative productiveness of the world's leading gold mines seems to be that the pre-eminence of the Rand is to-day even greater than is suggested by the statistics of annual production according to countries and States. The Rand is, of course, a field of large mines, and there are no contributions from small syndicates or mines worked on a small scale by practical miners and tributing concerns. Not only in regard to gold mines controlled by British capital but in so far as all gold mines are concerned the first half-dozen are located on the Witwatersrand, and since there are no present indications of the likelihood of new and large mines being discovered it seems more than probable that the Main Reef series will continue to possess the leading six, if not the leading dozen, individual producers of precious metal in the world for a number of years to come.

THE PROSPECTS OF THE APEX MINES.

Satisfactory Future Development Expected.—Half a Million Tons Exposed.

The consulting engineer's report on operations on the gold section of the Apex Mines for 1912, which accompanies the directors' report and accounts, states that development operations were suspended on the 25th July, 1912, since which date no work has been done beyond keeping the mine clear of water and maintaining the equipment. With regard to the work done during the year and the general position of the mine, he submitted the following remarks:—North section: The payable ore reserves of your mine on a milling basis, as at the 31st December, 1912, amounted to 496,438 tons, having an average value of 6·18 dwts. over an average width of 59·37 inches. As compared with the payable ore reserves as at 31st December, 1911, this shows an increase in tonnage of 238,378 milling tons, and a decrease in value of 0·32 dwts. The foregoing ore reserve figures are the result of a complete recalculation from the assay plan data, and on this account differ slightly from the figures given in the report for the quarter ended 30th September, 1912, which were based on the estimated tonnage developed month by month. In the calculation of the unpayable tonnage given in the manager's report no account has been taken of a "barren area" which lies parallel with and east of the main incline shaft. The breadth of the area is some 500 feet and the length amounts to 1,600 feet. No reef either payable or unpayable exists in this area, and in consequence no tonnage can be assigned to it. The area developed, as at 31st December, 1912, amounted to some 49 claims, and the payable ore amounts to 10,000 milling tons per claim. Inasmuch as the "barren area" appears to be merely a local development it is probable that future work will show a considerably larger tonnage of payable ore per claim, and the results should be more in accordance with those obtained in the neighbouring mines. The feature of the year's work has been the consistently payable values obtained over a wide width of reef in the section of the mine west of the main incline. At the time work was discontinued all drives in this section were proceeding in pay ore. With regard to the underground equipment of the mine, good progress has been made with the installation of the conveyor belt haulage in the main incline, 2,150 feet being in operation at the date of closing down. This conveyor belt haulage has worked most successfully and at very low cost. The pumping installation has been increased by the addition of two pumps at the fifth level, each having a capacity of 10,000 gallons per hour. The pumping plant is now capable of handling 60,000 gallons per hour from the bottom of the vertical shaft and should be sufficient to handle all water which is likely to be encountered in the course of future work. On the south section no work has been done during the year. The consistently good results obtained from the working of the neighbouring mine, Brakpan Mines, Ltd., coupled with the development results obtained in the western section of your property, lead me to believe that future development will on the average prove quite satisfactory.

THE RAND'S ORE RESERVES.

A Review of the Development Work of 1912—A Satisfactory Showing—A Strong Position Further Strengthened—Some Notable Increases.

It is not at the moment possible to reproduce in complete form our usual table of Rand ore reserves as at the end of the year, since all the companies included within the scope of the statistical review have not yet issued their annual reports. We are, however, in possession of the statements published by the majority of Witwatersrand mines, and since these disclose the positions in regard to ore developed at the end of 1912 or at dates closely approximating to the end of the year some study of ore reserve figures is here called for.

Importance of Ore Reserve Figures.

The importance of this aspect of the Witwatersrand mining industry is scarcely capable of exaggeration, so that when the full and complete returns are available we shall publish them without anything approaching apology for repetition. For the present we must content ourselves with an examination of such statistics as are before us and without reference to aggregate totals for the whole gold field. So far as can at present be judged 1912 witnessed quite as much activity in regard to the blocking out of reserves as did 1911. In all probability there was not such a marked increase in reserves as between 1912 and 1911 as was shown in a comparison of the 1910 and 1909 figures, but notwithstanding the marked advance in ore milled (in 1912 there were crushed 25,486,361 tons as compared with 23,888,258 tons in 1911) the aggregate tonnages blocked out presumably show no decrease; in other words, the mills did not gain on the reserves. Some companies (in so far as returns to date are concerned) show increases, notably the New Modderfontein, Modder B, Randfontein Central, Brakpan, Consolidated Langlaagte, and Van Ryn Deep. Others, again, record declines, and under this head reference must be made to the Geldenhuis Deep and the East Rand Proprietary Mines.

Lack of Uniformity in Details.

In comparing ore reserve statements for the year ending 1912 with those for previous periods in the Rand's history, special reference must be made to the adoption by the Central Mining and Investment Corporation of shillings and pence as denoting the value of ore reserves in place of dwts. and decimals of a dwt. The practice is undoubtedly a good one, inasmuch as it enables one to visualise and realise the contained value of these reserves better than is brought home to one through the medium of pennyweights. From the shareholders' point of view the aggregate profitable cash result and the amount of money distributable in the shape of pounds sterling as dividends are the supreme factors in a company's operations and balance sheet, and the publication of ore reserve values in terms of shillings and pence brings matters more into line with this view than hitherto. We cannot refrain from again commenting on the lack of uniformity exhibited in official declarations as to the ore in reserve. No one can realise to a proper degree how great this dissimilarity between the returns of different companies is until an attempt has been made to prepare a schedule of complete development statistics. Some companies declare their developed ore in terms of mining tons, others in terms of milling tons; that is to say, mining tons subject to deductions on account of sorting. In some instances one comes across references to suspense accounts in ore reserve statements. Certain companies state the amount of ore recoverable in shaft and stope pillars, etc.; other companies do not enlighten one in this respect. These are but a few of the differentiations to be observed. There are, too, naturally many variables resulting from different thicknesses of reef, and therefore different stoping widths, etc., in different mines. Furthermore, as working costs vary materially as between one mine and another, the pay limits vary largely. These latter inconstant factors are, of course, decreed by the conditions peculiar to each mine, and are thus inevitable; but we certainly think it would be to the great advantage of shareholders were the methods of declaring reserves, as between different groups and different mines, brought more closely into line.

Corner House Mines.

To turn first of all to the leading Rand House—the Central Mining and Investment Corporation—a small decrease both in quantity and value is recorded by the Bantjes Consolidated, where 840,800 tons of 7 dwts., or 29s. 3d. per ton value were blocked out at the end of the year. The reserves of the City Deep have advanced from 2,078,805 tons to 2,123,650 tons, and the value at 8·7 dwts. (36s. 3d.) is ·6 dwt. higher. The Crown Mines, with 10,607,671 tons, worth 7·09 dwts., or 29s. 9d. per ton, represents the most satisfactorily developed gold mine in the world and, as remarked in our last issue, the total value of the reserves stands at about fifteen million pounds. At the end of the preceding year there were developed 10,124,072 tons of 7·25 dwts. per ton value. At the Durban Roodepoort Deep where, on account of the comparatively thin nature of the reef and the small capacity of the reduction plant, a substantially smaller reserve has been developed than at the other great Rand Mines, Ltd., deep levels, 1,306,100 tons, worth 6·9 dwts., or 29s. per ton, were developed, as against 1,288,071 tons, value 6·8 dwts., a year previously. The Ferreira Deep having acquired the now well-nigh exhausted Ferreira property this year records a reserve of 2,070,900 tons (including Main Reef cum Leader with some 420,000 tons in shaft and boundary pillars) as against 1,837,808 tons (value 9·7 dwts.) in the Ferreira Deep and 324,603 tons (value 8·13 dwts.) in the Ferreira a year ago. The Geldenhuis Deep's reserve, 1,904,700 tons (6·3 dwts., 26s. 6d.), is less by 359,000 tons, but the value is slightly higher, whilst the Nourse Mines tonnage, 1,969,000, is a little down, the value at 28s. remaining stationary. Modder B, at 2,594,000 tons (7·2 dwts., 30s. 3d.), shows a gain of about a quarter of a million tons, but the value is ·3 dwt. less. The New Modderfontein, at 3,900,000 tons, showed an immense reserve at the end of the last financial year. The increase in quantity is 558,000 tons and there is also an improvement of over 2s. in value. The Rose Deep's reserve has advanced slightly from 3,670,160 to 3,695,100 tons, the assay value remaining at 6·1 dwts. per ton. The Robinson's reserve at the end of 1912 of fully payable and developed ore was 1,130,600 tons (11 dwts., or 46s. 2d.), as compared with 1,221,661 tons, value 11·4 dwts., at December 31st 1911. In addition to these tonnages there are large quantities of low grade ore and tonnages estimated to be recoverable from old workings, etc. The Village Deep's reserve of 2,235,300 tons (6·9 dwts., 29s.) compares very favourably with 2,159,792 tons, value 6·1 dwts., a year ago, the improvement in value of nearly a dwt. per ton being particularly gratifying.

The E.R.P.M.

As to the East Rand Proprietary, a thorough investigation of the developed ore in the mine was made during the year, and the result showed the ore reserves at the 31st December, 1912, to be: Main Reef, 343,119 tons, value 5·3 dwts.; Main Reef Leader, 4,487,291 tons, value 7·0 dwts.; Main Reef and Leader (composite), 1,182,890 tons, value 6·6 dwts.; total, 6,013,300 tons, value 6·8 dwts. Twelve months previously the reserves were estimated at 6,716,605 tons of 6·9 dwts. value.

Randfontein and Langlaagte.

The Randfontein Central's reserves were increased from 5,658,859 tons to 7,600,000 tons (6,350,781 tons of 6·8 dwts. ore) whilst the values of these aggregates were at the end of 1912 6·2 dwts., end of 1911 7·24 dwts. The report of the directors of the Langlaagte Estate gives the ore reserves at the end of 1912 as 1,370,639 tons (value unstated) as against 1,281,307 tons at the end of 1911.

New Kleinfontein.

The payable ore reserves of the New Kleinfontein Company at 31st December, 1912, amounted, on a milling basis, to 1,190,663 tons of an average value of 7·59 dwts., an increase in tonnage of 44,000 tons and in value of 0·1 dwt., as compared with the figures for the year ended 31st December, 1911. The value of the ore reserves as shown above will justify a mill bin value of approximately 7·0 dwts., due allowance having been made in assessing this value for development ore and ore from sources not included in the above reserves.

Two "Gold Fields" Deep Levels.

The fully developed ore reserves of the Simmer Deep a year ago were estimated to be 1,312,000 mill tons, of an average mill value of 4·9 dwts., which is equivalent to 1,469,719 mine (or unsorted) tons of an average value of 4·4 dwts. The estimated reserves at 31st December, 1912, are 430,693 mine tons, fully developed, of an average value of 4·2 dwts. per ton, and 144,296 mine tons, partially developed, of an average value of 4·08 dwts. per ton. In the sister mine, the Jupiter, the fully developed ore reserves at the end of the year were estimated to be 1,270,000 mine tons of an average value of 4·4 dwts. In the previous annual report they were given at 1,089,000 milling tons of 5·74 dwts. value.

Neumann Mines.

The Witwatersrand Deep at the end of September last had 1,332,243 tons, value 29s. 3d., as compared with 1,436,202 tons, value 28s. 9d., at the end of 1911. The Knight Central Company's reserve at December 31st, 1911, was 644,300 tons, value 25s. 8d. At the end of 1912 there were developed 647,000 tons of 6·1 dwts. ore. The report of the Wolhuter for the year ending 31st October, issued a month or two ago, states the total reserves to be 832,977 tons, value 6·48 dwts., an improvement in quantity of 24,000 tons, accompanied by a slight increase in value as compared with twelve months previously.

Brakpan.

That brilliant offshoot of the Consolidated Mines Selection Company, Brakpan, improved its development position during 1912. The payable ore reserves at 31st December totalled 2,457,000 tons of an average assay value of 6·74 dwts. Compared with the previous year's estimate there is an increase of 532,000 tons, the assay value remaining unchanged. Although essentially due to excess development, the gain in tonnage has to a certain extent been influenced by the general re-cast of the estimate after further experience as to breaking conditions. The reef width of the payable ore averages 39·37 inches assaying 10·39 dwts. per ton, as compared with 39·06 inches averaging 10·05 dwts. at the end of the previous year, the estimated stoping widths being 61 inches and 58 inches respectively.

Barnato Mines.

Of the mines under the control of the Johannesburg Consolidated Investment Company, or, as it is more commonly known, the Barnato group, the Consolidated Langlaagte amongst the crushing companies and the Van Ryn Deep (a developing mine) record the largest increases. The following table gives particulars of the reserves of this group at the two periods.

		Tons.	Value. Dwts. per ton.
Consolidated Langlaagte ...	1912	2,069,630	6·4
,, ,, ...	1911	1,619,647	6·7
Ginsberg	1912	346,681	6·9
,, ...	1911	367,645	6·8
Glencairn	1912	761,000	3·6
,, ...	1911	925,000	3·5
New Primrose	1912	413,033	6·5
,, ,, ...	1911	423,311	6·7
New Rietfontein	1912	265,994	6·5
,, ,, ...	1911	361,484	6·1
New Unified	1912	275,028	6·4
,, ,, ...	1911	288,343	6·73
Van Ryn Deep	1912	1,086,303	8·4
,, ,, ,, ...	1911	603,716	7·17
Witwatersrand	1912	1,331,540	6·1
,, ...	1911	1,225,084	5·65

In the case of the Glencairn the definitely payable ore reserves in the mine amount to 205,418 milling tons and in addition to this it is estimated there are 1,111,164 tons of reef of doubtful value. Assuming 50 per cent. of this tonnage to be payable, the reserves would amount to 761,000 milling tons and the estimated recovery may be placed at 3·6 dwts. Re-estimation of ore in reserve at the New Rietfontein has shown that the payable reserves amounted to 135,887 milling tons of an estimated recovery value of 6·5 dwts. In addition to this there are developed in the mine 260,214 milling tons of uncertain value. Assuming that 50 per cent. of this rock will prove to be payable, then the total payable reserves would amount to 265,994 tons. At the end of the year the payable ore reserves in the Van Ryn Deep mine amounted to 1,278,003 tons of an assay value of 7·1 dwts. over an average stoping width of 51 inches. It is assumed that 15 per cent. of the rock mined will be sorted out as waste, and this would bring the milling tonnage to 1,086,303 tons of an assay value of 8·4 dwts.

The Year's Work in Brief.

The foregoing facts and figures should suffice to show that despite the enormous calls made by mills last year on the underground faces, there has been no encroachment on ore reserves. In a number of instances decreases—but not serious decreases—are to be observed. On the other hand numerous mines record substantial augmentations of tonnage in reserve. It is particularly gratifying to note the very satisfactory improvements in value of aggregate tonnage recorded by certain of the larger and more important units of the industry. The foregoing does not attempt to review in full the comparative ore reserve positions of all the mines of the Rand as at the conclusions of the two last years. Until all the reports are issued such a statement is impossible, and we have contented ourselves with covering the returns of companies that recently have held their annual meetings or issued reports for the past year. Sufficient has, however, been said, we think, to justify the view that despite many difficulties the inherent stability of Witwatersrand mines as defined in terms of ore reserves was further strengthened during 1912.

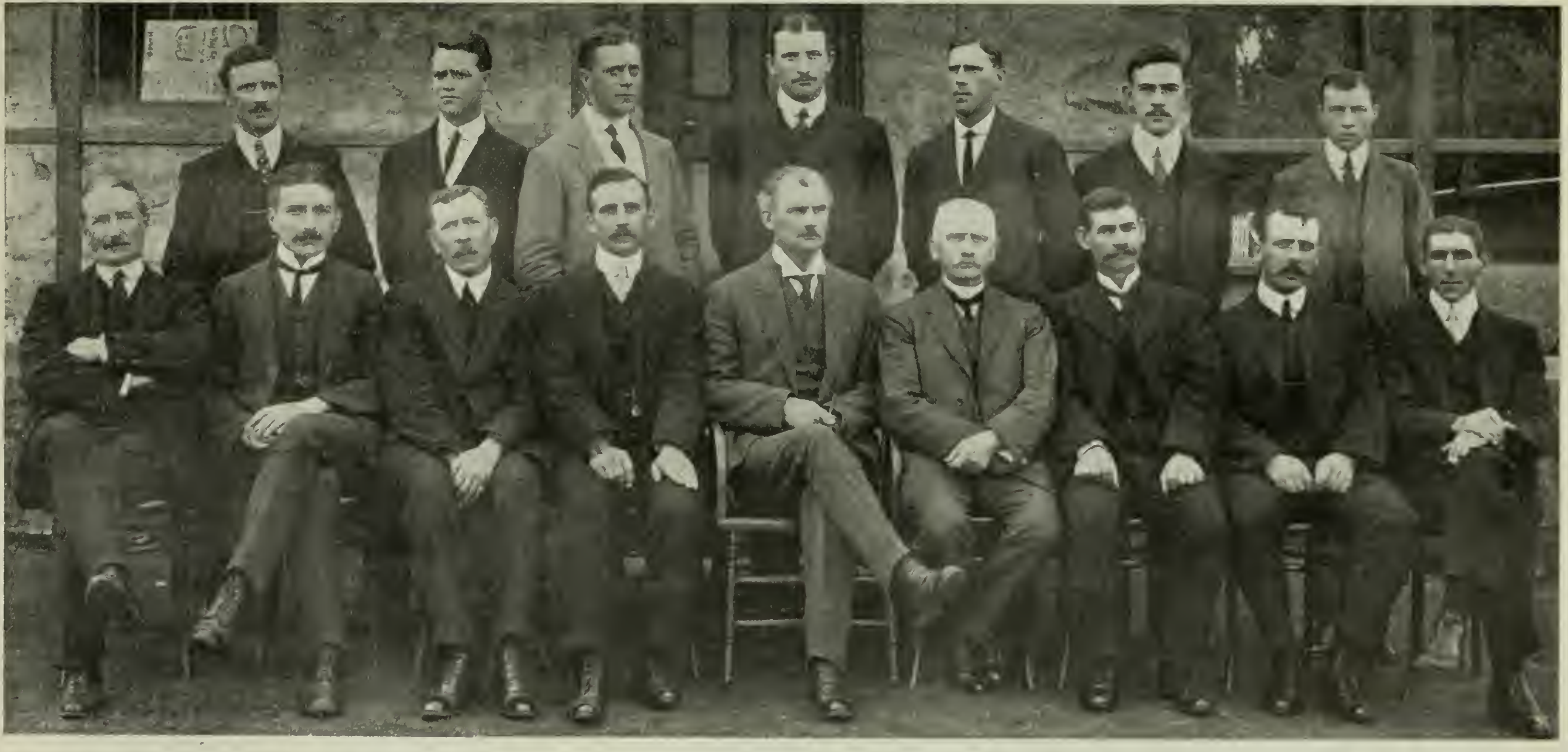
Diamond Taxation.

In the House of Assembly this week Mr. Madeley (Springs) asked the Minister of Mines: (1) Whether his attention has been drawn to the statement that Messrs. Barnato Bros. had pronounced in London that the Union Government had no intention of imposing a tax on diamonds; (2) whether he had authorised such announcement, and, if not, what action he proposed to take to prevent future misuse of the name of the Government in sharemarket dealings; and (3) whether the Government would in future await reports on local investigations of specific questions in regard to this matter before giving information to interested financial corporations or others. The Minister replied that he had no knowledge of the newspaper statement referred to. Any such statement was quite without authority.

Mines and Works Act, 1911.

The Government has submitted to the Chamber of Mines various proposed new and amended regulations under the above Act for any recommendations it may have to offer, which regulations are at present being considered by a sub-committee of the Chamber.

THE MANAGER AND STAFF OF THE MAY CONSOLIDATED G.M. CO., LTD.



Front Row (left to right): R. Temple, storekeeper; K. Förster, surveyor; W. J. R. North, battery manager; T. Farris, engineer; K. H. Sartorius, general manager; E. I'ting, mine secretary; T. Aver, mine captain; J. Neilson, cyanide manager; E. E. Currin, compound manager.

Back Row: E. Davis, shiftboss; W. C. Siddle, secretary's assistant; H. J. Kebble, sampler; A. Krischnick, shiftboss; M. McKendrick, native timekeeper; F. E. Flawn, assistant native timekeeper; L. E. Harris, assistant storekeeper.

A TRANSVAAL SODA INDUSTRY.

The Pretoria Salt Pan a Big Soda Deposit—Exceptional Purity of the Manufactured Product—The Question of Market and Revenue.

One of the most interesting features of the Bushveld country, to the north-west of Pretoria, is the remarkable crater-like occurrence, known as the Salt Pan. Cohen, who first described the geological character of the pan, pointed out its resemblance to the explosive craters, or "Waaren" of the Eifel, although the volcanic ejectments, which are usually found in the neighbourhood of the latter, are completely absent in this case. "The depression is almost perfectly circular," remark Messrs. Hatch and Corstorphine, in their *Geology of South Africa*, "the boundary ridge, which consists of granite, drops steeply to the flat bottom, the vertical distance being 260 feet. The bottom is generally covered by water, which on evaporation yields a deposit consisting of chloride and carbonate of soda. Since Cohen's visit, a borehole has been put down in the middle of the pan (under the supervision of one of the authors), and the results obtained have proved the existence of a considerable deposit of natron below the present surface." The borehole referred to proved the existence of the soda deposit to a depth of about 200 feet, beyond which point the work was not continued. The actual circumference of the deposit is given by others at about a mile, and in a statement issued recently it is asserted that the area of good soda has been proved to a diameter of 216 yards, and that the amount of anyhydrous sodium carbonate estimated to exist over this area, to a depth of 8 feet only, is about 50,000 tons. Since soda compounds were found to a depth of 200 feet, as already mentioned, it seems clear that an almost unlimited quantity may be relied upon.

Analytical Evidence.

Analyses which have been made of the saline material are somewhat remarkable, inasmuch as they show that the carbonate of soda is present in the unusual form of a trihydrate to the extent of 66 per cent. of the mass. These assays have been made by Mr. John Watson, F.I.C., Johannesburg, who has had some fourteen years' experience in alkali manufacture in England; by Mr. W. B. Marshall, Ph.C. (Lond.); and by Mr. J. Snodgrass, L.C.G. These are practically confirmed by the analytical results of material taken from the borehole referred to by Messrs. Hatch and Corstorphine, and recorded in their work. Mr. Watson's analyses show that the sodium carbonate obtained by a simple process of recovery from the raw material of the Pan exceeds the purity of the Tyneside standard, the relative purity being 38·40 per cent. as against 34·19 of the standard. The high percentage of carbonate of soda and its exceptional purity, the comparatively small percentage of sodium chloride, or common salt, in the brine obtained from the pan, together with the absence of any other chemical impurity, renders the product of this deposit one of a somewhat unique kind. The insoluble impurities are clay and mud derived from the granite walls of the crater and some organic material resulting from decayed vegetation. It is asserted that by merely roasting the material to drive off this constituent as far as possible, a product of soda is obtained containing 80·85 per cent. of carbonate of soda. At present treatment of the crude stuff from the Pan is being carried on in Johannesburg upon a modest scale, both for purposes of demonstration and to make the beginnings of a market. In both directions the efforts of those associated with the venture have proved successful. The roasted material, to describe the operation briefly, is boiled in order to obtain a brine containing all the soda contents. The brine is then submitted to a freezing process during which the carbonate of soda crystallises out, leaving practically all the sodium chloride in solution. The process can be carried to any point of refinement necessary, but the simple methods already described are mainly responsible for the yield of the soda crystals which form the basis of the alkali industry which it is proposed to establish.

The Question of Cost and Profit.

Government Blue Books show that the South African consumption of alkali compounds amount to some 7,000 tons tons annually, of the value of about £38,000. In addition to this the Indian market consumes about 40,000 tons and the Australian Colonies about 30,000 tons yearly of alkali compounds. It is considered that in view of this demand the question of a market is one that need cause no anxiety. It is proposed to transport the raw material from the Salt Pan to Haman's Kraal station, a distance of 11 miles, and thence to a works near Johannesburg. The cost delivered is estimated at about 15s. per ton. A plant calculated to be able to produce 5,400 tons of crude soda per annum has been estimated to cost a little less than £4,500, and the product comprising 1,200 tons roasted crude soda at £2 10s. per ton; 1,800 tons soda crystals at £5 per ton; and 1,000 tons refined alkali at £10 per ton figures at a total value of £22,000. Working costs, including rent, royalty, depreciation, etc., are put at £10,300, leaving a net profit of £11,700. The company at present engaged in the enterprise has a nominal capital of £20,000, of which £8,000 is working capital. An experimental plant, capable of producing about 30 tons of soda crystals per month, and on purely an experimental scale, therefore, has been erected at the lower end of Main Street East, and the washing soda now being manufactured is said to be admitted by the "trade" to be the best and purest in the market, the price obtained being £5 10s. per ton. In addition to the market for soda crystals and refined alkali, it is hoped that a large sale will be found locally, among the mines, for the roasted crude soda. Mr. W. B. Marshall, who has been investigating this side of the problem, considers that the so-called soda ash should replace lime on the mines for neutralising purposes, since the resulting product is soluble, whereas lime gives an insoluble substance which continually chokes the pipes. The addition of soda ash to boilers would at the same time, it is claimed, prevent incrustation in steam boilers and at the same time raise the temperature of the boiling water. Samples of the products manufactured by the company are on view at the Mining Exhibition now being held in the Drill Hall, and Mr. Marshall will be glad to demonstrate the advantages of using the soda ash for the purposes mentioned to anyone who is interested in the matter.

At the Port Elizabeth Show, Sir Frederic de Waal, in his opening speech, reverted to an incident which had occurred at the luncheon, where he (Sir Frederic) had said that the farming industry would go on for ever, whereas the mining industry would one day cease. Mr. Francis Oats, chairman of De Beers, contradicted this, saying that the mining industry in South Africa would continue as long as the world lasted, and that it was the taxes from the mining industry which enabled the Administrator to build schools and hospitals.

Zaaiplaats Tin.

The results for the month of March, 1913, are as under: Days run, 29·9 days; ore milled, 3,181 short tons; residues re-treated, 855 short tons; concentrates won, 102 long tons; average value of concentrates, 70·2 per cent. M.T.; estimated profit for the month, excluding Government Tax on profits, £8,489 1s.; add adjustments in respect of estimated values of previous shipments, £217 3s.; profit declared for the month, £8,706 4s.; capital expenditure, £41 8s. 1d.

RANDFONTEIN NO. 3 SHAFT TEAM.

Winners of the Ferguson Ambulance Shield, 1913.

Top Row, from left: W. Gates, A. E. Dymond, M. Roach (Sec.).
Bottom Row, from left: W. Reynolds, A. Tippett (Mine Capt.), J. Larkin (Team Capt.).

VAN RYN DEEP.

A Satisfactory Year's Development—Value of Milling Tonnage Estimated at 8·4 dwts.

At the Van Ryn Deep, one of the developing mines of the group, marked progress was made last year. Mr. J. G. Lawn writes in his consulting engineer's report:—

The development from the East Incline Shaft has proved all that could have been hoped. Three levels have been opened up from the East Incline below the big down-throw fault—the fourth, fifth and sixth—and the values both east and west of the shaft have been highly satisfactory. Indeed the ground to the east and between the shafts is of good grade. To the west of the West Incline Shaft the values have been mostly poor as heretofore, though some encouragement has been met with, and it is satisfactory to note that the good ground spreads further westwards as depth is attained. The West Incline Shaft passed through the big down-throw fault between the fifth and sixth levels as was anticipated. Beyond the fault the reef was proved by a borehole to be 120 feet below the fault. The value was 65.3 dwts. over 16 inches, but so far it has not been possible to drive on this horizon. At the end of the year the payable ore reserves amounted to 1,278,003 tons, of an assay value of 7.1 dwts. over an average stoping width of 51 inches. It is assumed that 15 per cent. of the rock mined will be sorted out as waste, and this would bring the milling tonnage to 1,086,303 tons, of an assay value of 8.4 dwts. The reduction plant has been ordered, and its erection is now being proceeded with at as rapid a rate as possible. It will consist of 80 stamps, each 1,900 lbs. in weight, and 8 tube mills. The ore will be transferred to the plant from the shafts of 40-ton trucks drawn by a steam locomotive. There will be a sorting and crushing station. Cone classifiers will be used for grading the crushed product, and the pulp after amalgamation will be classified as usual into sand and slime. The sand will be transferred from the collecting tanks by belts, and will be deposited in the treatment tanks by a Baisdell distributor. The slimes plant will include air agitating tanks and a Butters' filter-press installation. Precipitation of the gold will be by zinc in steel boxes. The plant will have a capacity of some 40,000 tons per month, and electric power will be used throughout. It was hoped that the plant would be completed by the middle of the year, and that everything would be ready to start the mine on a producing stage by then. This is still possible, but the industrial prosperity in Europe has been a great hindrance. Not only were the times quoted for delivery of plant much longer than has hitherto been usual, but the times quoted have been considerably exceeded in the case of some items. However, no effort will be spared to start the plant at the time anticipated. In every other respect the position of the mine is highly satisfactory, and its future may be looked forward to with confidence. The Manager and underground staff have devoted considerable attention during the year to improving conditions in the mine with a view to combating the miners' phthisis scourge. Wherever possible the lay out of the work underground has been carried out with this object in view, and no effort has been spared which would tend to the reduction of the quantity of dust floating in the mine. It is hoped that beneficial results will be apparent in the immediate future.

THE T.C.L. TIN INTERESTS.

Results at Groeufontein—Prospecting with the Diamond Drill—The Alluvial in the Zaaiplaats Valley.

ALTHOUGH the report of the Transvaal Consolidated Land and Exploration Co., Ltd., for 1912 can only record an estimated profit of £9,704 3s. 6d. as a result of tin mining operations at Groenfontein, as against an estimated profit of £32,890 7s. 5d. for the year 1910, the report in itself, from a technical standpoint, is of much more interest than it was when things were more flourishing than they are today. The outstanding feature of the year's work appears to have been the active and systematic measures taken to prospect the company's property, and it is gratifying to find that the scheme has met with some success. It is to be regretted that some definite information is not yet available with regard to the alluvial deposit in the Zaaiplaats Valley. We believe that investigations have been in progress there for some time past, and judging from the natural conditions which prevail in the vicinity the valley should contain some extremely rich deposits. The following statement covers all that there is to be said about its value so far:—" With an erratic deposit of this nature, it is quite impossible to forecast anything." The directors report states that the company's entire interest in the Leeuwpoort (African Farms) Tin Mines, Ltd., has been realised during the year at a profit of £12,789 0s. 10d. The following extracts are taken from the report of Mr. J. Jervis Garrard, the consulting engineer of the company:—

Witfontein, No. 371, *and Newbury, No.* 937, *District Waterberg.*—375 feet of sinking, driving and raising have been carried out on the tin occurrence in the shales and felsites of the Lower Waterberg series mentioned in the last annual report, making a total of 2,131 feet of surface trenching and 1,293 feet of sinking, driving and raising. An irregular ore body, mineralised from the fissure and carrying fair tin values, has been opened up to the 88ft. level, where it has been explored by driving and winzing. The main shaft has been carried to the 150ft. level, where a cross-cut has intercepted the fissure, along which driving is now proceeding to locate further ore bodies mineralised from it. The fissure itself is well defined, and carries from traces to 0.5 per cent. of tin over 18in. of fissure and wall, but, owing to the character of the deposit, it is not anticipated that the fissure itself will be the ore carrier, but rather that bunches of profitable ore, similar to that already found, will be located in the walls of the fissures, due to replacement by tin-bearing vapours which have found their way up through the fissure as a channel. Owing to the irregular nature of this ore body now being worked upon, it is not possible to arrive at any correct estimate of the tonnage of profitable ore already developed and ready to be stoped. At the end of 1912, there were sorted at grass from development 497 tons of ore, assaying 2.36 per cent. metallic tin and 2.12 per cent. copper per ton.

Welgevonden, No. 777, *and Welgelegen, No.* 357, *District Waterberg.*—No further work has been carried out by the Company during the year. Negotiations are pending for the granting of a tributing lease over a portion of Welgevonden.

Weynek, No. 763, *District of Rustenburg.*—No development work has been done during the year. The question of a plant for dealing with the ore developed is under consideration.

Mutue Fides, No. 1841, *and Tygerpad, No.* 2300, *District Waterberg.*—Owing to the discovery made on these farms, referred to in the first section of the report, the Company decided to prospect the remainder of these farms, which are situated about 50 miles south-east of Potgietersrust and 6 miles from Olifants River. The geological formation is red granite belonging to the Bushveld Complex, and similar to that of the Groenfontein Tin Mine. Prospecting was started on the Company's portion of Mutue Fides on the 1st September, 1912. During the period 1st September to 31st December a number of tin occurrences were opened in the form of impregnations and pipes in altered granite, at times associated with fissures. The quantity of ore extracted and dumped during the period is estimated at 74 tons of ore, containing 17 short tons of 70 per cent. concentrates. The prospect looks very promising, but it is too early as yet to make any statement as to the value of the farm as a future tin producer. This occurrence is on the Company's portion of the farm adjoining the discovery right granted.

Zaaiplaats Lease.—Prospecting by means of diamond drilling was carried out at the beginning of the year, and one hole located encouraging values, which should shortly be exposed by the exploratory work now progressing. Stoping operations were resumed in No. 1 Adit in May, and as a result 474 tons of ore were milled at the Groenfontein battery during November, yielding 34 short tons of concentrates, value 66.88 per cent. metallic tin. All the profitable ore in sight from this working has now been recovered, but it is hoped that the restricted exploratory work now being undertaken may open up fresh ore. The net expenditure on this property had been reduced on the 31st December, 1911, to £5,987 1s. 1d. Owing to realisation of the concentrates produced during the year, and after paying for all diamond drilling and other exploratory work this figure has been further reduced to £5,200 15s. 6d. as at 31st December, 1912.

Roodepoort Tributing Lease.—A lease of about 21 acres of the Company's farm Roodepoort, adjoining Groenfontein, was granted to the Zaaiplaats Tin Mining Company, Limited, in June last. This ground was previously worked by the Company as part of the Groenfontein Tin Mine, but is so far from the main Groenfontein workings that it appeared advisable to conclude this lease, whereby the Company receives two-thirds of all ore won, free of cost. As a result of this arrangement the Company received up to 31st December 1,690 tons of ore, which were treated at the Groenfontein Mill, and are estimated to have yielded 53 short tons of 70 per cent. concentrates. During the last quarter of the year the ore milled was of lower grade than during the previous quarter, and the tonnage also decreased.

Groenfontein Tin Mine.—The following are the details of the operations at the mine for the year:—Footage on main shafts, 319ft.; footage on adits and crosscuts, 327ft.; footage on fissure development, 1,352ft.; sundry footage, 1,461ft.; footage in profitable workings, 1,039—total, 4,498ft. The tonnage mined during the year was 16,382 tons.

Milling and Concentrating (*Tons of* 2,000 *lbs.*)—Number of stamps in operation, 10; running time (10 stamp basis), 115 days; mine ore treated, 3,675 tons; accumulated sands re-treated, 590 tons; ore treated from Roodepoort Tributing Lease, 1,690 tons; total treated all sources, 5,955 tons; total concentrates produced, 300.72 tons; average grade in metallic tin, 71.26 per cent.; alluvial concentrates produced, 16.8 tons; average grade in metallic tin, 73.08 per cent.; total concentrates produced from all sources, 317.52 tons; average grade in metallic tin, 71.37 per cent.; estimated profit, £9,704 3s. 6d. The Capital Expenditure for the year was £4,860 5s. 11d., mainly in connection with the new slimes plant, power plant and water supply. The output of 317.52 tons of 71.37 per cent. concentrates during 1912, compared with 364 tons of 67.8 per cent. concentrates in 1911. The profit was £9,704 3s. 6d. for 1912 as against £7,476 9s. 6d. for 1911. The main tin producer during the year has been No. 19 working, which was found as a direct result of the diamond drilling operations and development on well-defined fissures referred to in the last annual report. A similar discovery was also made in No. 23 working, where good tin values have also been found along lines of fissuring. Where these fissures cut the soft seam of fine-grained granite underlying the main pegmatite vein (which runs from end to end of the property) good patches of ore have been opened up, proving the undoubted benefits to be derived from borehole prospecting and fissure development. The main No. 9 pipe (which was at one time the chief producer of this mine) is still being sunk upon, and is as well defined as ever, although it carries no tin values, but a branch of this pipe has been located, rising to the surface, which has yielded a considerable tonnage of concentrates. The outstanding feature of the year's work is the proof given of the necessity for further diamond drilling and for the continuation of underground development to locate irregular impregnations, which undoubtedly exist along certain well-defined fissures. This work has been arranged for. It now appears to be reasonably assured that, as indicated in my last report, these fissures have formed the channels through which the tin-bearing vapours ascended, and that not only have these vapours enriched the pipes which the fissures may happen to have intersected, but have also impregnated a zone of fine-grained granite underlying the main pegmatite vein abovementioned, forming irregular patches of rich tin ore wherever these fissures happen to have intersected the pegmatite vein. Additional plant was brought into operation in December for the treatment of accumulated slimes, which it is anticipated will help considerably to maintain the output necessary to cover extensive development work, and at the same time to show a small profit, until such time as the mine can again become an important producer. The Hydraulicing Plant on the top of the hill behind the mill completed the removal of overburden from the first valley in August. Several small ore bodies were exposed, but no large pipes. An important fissure, however, was laid bare showing small adjacent impregnations; this is being followed up. The plant was removed to the next valley and was ready to start again in September, but, owing to the exceptional drought, it was not possible to recommence working during the year, as the available water was required for the mill. The plant recommenced work in January, 1913, and is working very satisfactorily. The Central Power Station, erected primarily to furnish the necessary power for pumping water for the hydraulicing plant, has also been utilised for supplying the power required for the mill and return water pumps; had it not been installed it would have been necessary to close down the mill for four months, as the former mill water supply gave out completely owing to the severe drought. A further series of tests in Zaaiplaats Valley on the farm Roodepoort is being carried out by means of an Empire drill to prove finally the value and extent of the deep alluvial wash, which is known to be tin-bearing in places. With an erratic deposit of this nature, it is quite impossible to forecast anything. All that can be said is that new discoveries of minor importance are continually being made, which keep things going, whilst there is always as good a chance as ever of again striking something really good, like No. 9 pipe, which produced over £100,000 worth of tin.

MINE SAMPLING AND ORE VALUATION, WITH SPECIAL REFERENCE TO THE WITWATERSRAND AREA.—II.

[By Arthur S. Lejeune.]

Sampling—(*Continued*).

(b) *Sampling in Raises and Winzes.*—The sampling of raises and winzes is carried out in exactly the same way as the sampling of stopes, with this difference, viz.: The sections are taken with smaller distances between them. The usual distance is five feet. On some mines it is the practice to sample a raise or a winze on the left hand and right hand sides alternately. For example, if the first section be taken on the left, the second is sampled on the right, and so on. This is a very commendable method, as the value obtained gives a more clear conception of the true value of the block of ground through which a heading is passing. In sampling raises and winzes it is not necessary to measure the waste rock above the reef, as the stoping width is arrived at in a manner which is described in Chapter III.

(c) *Sampling in Drives.*—Sampling drives is more difficult than either of the foregoing, inasmuch as it is more difficult to measure the width of the sample. The actual sampling is done precisely as in the case of stopes, raises and winzes, but when we come to measuring the difficulty arises. Two cases present themselves: (1) When the section is at the face of the drive; (2) when the section is back from the face. (1) When the section is taken at the face the measurements are easily taken as shown in fig. 2.

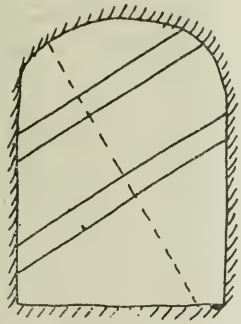


Fig. 2.

The dotted lines show the direction in which the measurements are made, *i.e.*, at right angles to the bedding planes. (2) When the section is taken back from the face the bedding planes should be reconstructed by stretching a tape from one side of the drive to the other, taking care that if one end of the tape is held on the top of a band, the other end is on the top of the same band. This is shown in fig. 3.

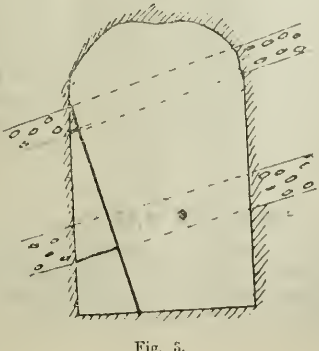


Fig. 3.

The dotted lines indicate the position in which the tape should be and the thick lines represent the position of the rule. When sampling in crosscuts through the reef a continuous section is sampled right along the crosscut, and measured as shown in fig. 4. The dark lines indicate the

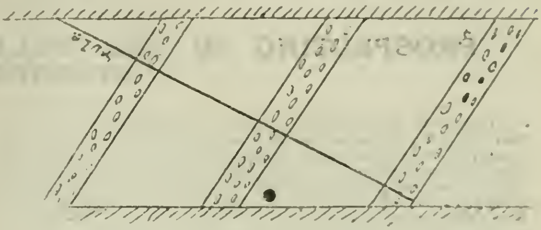


Fig. 4.

position of the rule. A method was brought forward some time back of taking samples of a reef in a manner indicated in fig. 5. The area off which the sample was chipped is

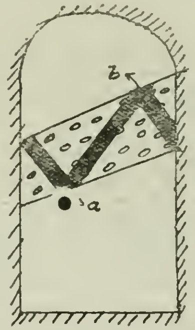


Fig. 5.

shown in the heavy black band. It was thought that as the sample was spread over a greater area a better idea of the value would be obtained. This method, however, is not to be commended as obviously the portions marked *a* and *b* will have more taken off them than any other part. Should these portions be the rich ones it follows that the value of the samples as an indication of the gold contents of this particular band would be decreased. Should, however, these portions be poorer the difference in the value would not be marked. Another point against it is that a sample of this nature would take a much longer time to knock off than an ordinary one, and where it is necessary to get the sample assayed as soon as possible time is a great consideration.

(d) *Sampling in Crosscut Raises and Winzes.*—In these, as in the case of crosscuts, a continuous section is taken, as

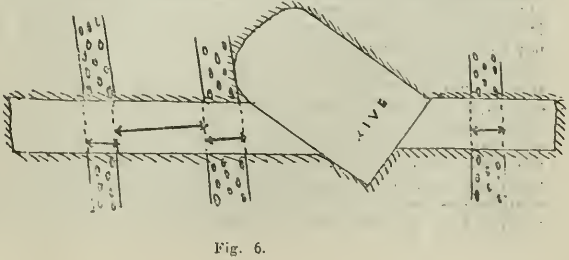


Fig. 6.

shown in fig. 6. The position of the rule is shown by the heavy black lines. To summarise: The chief points to be observed in taking samples are the following:—(1) Wash the face down well; (2) chip off the sample evenly so as to get an equal quantity from each portion; (3) measure the width of the sample strictly at right angles to the bedding planes. It is sometimes considered advisable to make an average sample from a number of samples. This can be done and the assay value of the resultant sample should closely approximate to the average of the individual samples, provided they are mixed properly. The mixing should be performed as follows:—Grind up all the samples to a fineness of, say, 60 mesh. Then take one ounce out of each sample for each inch of reef it represents. To better explain this, the following example may be taken:—Sample No. 1, width 10 inches; sample No. 2, width 6 inches; sample No. 3, width 18 inches; sample No. 4, width 4 inches; sample No. 5, width 8 inches. To make an average sample of the above, take 10 ounces of No. 1, 6 ounces of No. 2, 18 ounces of No. 3, 4 ounces of No. 4, 8 ounces of No. 5. Result, sample 46 ounces, representing 9·2 inches of reef.

(To be continued.)

PROSPECTING IN THE MACEQUECE GOLDFIELDS AND ITS NEIGHBOURHOOD.*

One of the most interesting and at the same time puzzling gold fields in South Africa is the Macequece field. The whole of the country in the neighbourhood of the Vengo appears to have been the scene of some great upheaval, the granite there having intruded from depth. The field as a whole holds out good prospects for the man looking for precious metals, and a portion that, in my opinion, merits more attention than it is receiving is the range of hills running between the Revue and Zambusi rivers and extending up to the so-called "Divide." Along this ridge, ribbon bar (banded ironstone) is met with, but it is not, I think, from this rock itself that the prospector may hope for great results, but rather from the oxidised quartzitic bodies that run parallel with these ironstone bars and from the country rock in which the quartz bodies are situated. If one continues along the ridge I have described as far as the old Revue mine, the country situated north and south in the Zambusi and Revue valleys respectively and extending along the borderline of the "Divide" shows better prospects than any other portion of this goldfield, especially in the rhyolite formation. This has the form of an igneous overflow, and may not continue to any depth, and in any case it will not have disturbed any reef appearing through it. If, however, the rhyolites extend upwards from depth, then their occurrence was probably simultaneous with the upheaval of the Vengo and the Divide. The appearance of the latter effected the separation of the Penhalonga and Revue valleys, thereby determining the westward flow of the waters of the Penhalonga valley. It would seem possible that the waters of this region originally flowed eastward, and that thus the bulk of the alluvial in the Revue valley originally came from Rhodesia. The Revue river certainly shows traces of a larger volume of water having formerly flowed over its bed than is now the case. Although the alluvial gold in the rivers here may not show indications of having been brought from any great distance, yet, it seems to me, that this may have been the case; gold travelling over a sandy river bottom does not become so worn as when travelling over a rocky bed, and right up to the foot of the divide the river bed has a soft sandy bottom.

Another problem is how the conglomerate body, not a breccia but an aqueous deposit, that lies on the north side of the Edmundian Copper Mining Company's claims, is to be accounted for? Here there are indications of an old river bed in which the waters must have been flowing before the Vengo and the Divide were upheaved from below. All this part of the country is well worth some very thorough prospecting, and such work would, I consider, amply repay anyone looking for precious metal. The Vengo may be said to constitute another great puzzle, the country here appearing to be faulted in every direction. It is to be hoped, however, that this faulting will not deter the prospector from examining this neighbourhood, for here, in the Vengo, a big thing should, I believe, some day be found, and the way to find it, in my opinion, is for the prospectors to stick close to the granite contact that appears on the hill, this contact being, I consider, near where the breccia appears on the north side of the mountain. With regard to base metals, I do not think that the Macequece field shows great possibilities, but the serpentine that is to be found in the Revue valley, in the direction of the Muza, over Mr. Aubert's farm, shows chrome iron and traces of platinum are also to be found, though it would in no way pay to prospect for the latter metal. A little zinc blende (sphalerite) and tantalite are also to be found in some of the spruits, though not in any quantities. Tourmaline of the schorl variety is plentiful, especially in the neighbourhood of the Muza, but the occurrence of tourmaline constitutes no certain indication of tin, but is merely an indication of the existence of a contact in the neighbourhood. Though the tourmalines accompany tin, nevertheless, unless one also meets at the same time with the other rocks associated with tin, it is useless to put in time and money prospecting tourmaline for tin. Dolomites appear traversing the Umchavara River. I am of the opinion that in the whole breadth of country extending from Pardy's to the contact at Macequece and eastwards along that entire width to the Divide any reefs met with should continue in depth and maintain average values. The neighbourhood of the Muza seems to me to possess different characteristics; there the reefs are lenticular and especially rich when situated in the talcose formation. An interesting portion of the country for the prospector consists of the altered rocks of the Bandula range. About six miles north of the station a rather wide hornblende body occurs and seems to be a likely formation for the discovery of gold. Here garnets are plentiful, though worthless commercially. I consider that if a prospector is looking for gold only, he cannot do better than stick to the Macequece region, but if the object of his search be base metals, then I think that he should go farther afield; he might, for instance, explore the Siluwu Hills, a promising belt, in my opinion, for the discovery of both precious and base metals, and continue his prospecting with advantage over a belt of country running north and south for some thirty or forty miles and about six miles wide. This belt of country extends across the country into Gorongoza, and water is fairly plentiful there.

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* By Mr. Gordon Ryan, in the Mining Journal of the Mozambique Co.

Roodeplaat Diamonds.

The secretary of the Roodeplaat Diamond Mining Co., Ltd., has supplied the following information:—The results of washing at the Roodeplaat Diamond Mine for March, partly from the alluvial and a small quantity from the mine, were 183 carats, valued at over £500. Small washings have taken place from the surface of the mine at two places which have yielded encouraging results. In one of these washes only clean yellow ground was treated showing without doubt that the diamonds come from the mine ground. It has been found, however, that the yellow ground—though not hard—does not treat with the ordinary plant now in use. The board, therefore, purchased two sets of rolls, which are now in course of erection, and as soon as the plant is reorganised with the addition of these rolls, which will be in about three weeks' time, further washings will be gone on with from the eight paddocks which have been put down on the mine, where there are lying at grass between eight and ten thousand loads. Arrangements are being made so that shareholders can see the diamonds that have so far been recovered by the company. In addition to the above, we learn that a small test wash was made of clean yellow ground from the No. 2 paddock after all the surface detrital material had been removed, together with six inches of the topmost yellow. This wash resulted in the recovery of four diamonds, a one-carat stone, worth £5 per carat, and three small stones. The average of this test comes out at seven carats per 100 loads, but the number of loads treated was small, the net number being 22. This result gives good hope that the expectation of 5 carats per hundred loads for the clean mine ground will be realised. The nature of the deposit from this test, containing garnet ilmenite and olivine, shows that the pipe material contains the usual minerals associated with the diamonds in pipes.

Wolhuter G.M. Co.

A dividend (No. 11) of six and one-quarter (6¼) per cent. for the six months ending April 30, 1913, equal to 1s. 3d. per £1 share, has been declared by the Wolhuter, payable to shareholders registered on April 30, 1913.

Rhodesian Section.

LATEST NEWS FROM THE MINES.

The Lomagundi Railway—Rhodesia, Ltd.—Closing Down Rumours—The Antelope Plant —Construction at the Shamva—Falcon Developments—The Salisbury Chamber of Mines.

The widening of the Lomagundi line to the ordinary broad gauge of the country was commenced on the 1st April, and it is hoped will be completed by the 1st of August next. We are glad to be able to state that it has been decided to carry on this line from the present terminus at Eldorado as far as Sinoia Township. This will be a great boon to farmers and others living on the other side of the Hunyani River, who frequently are "held up" during the wet season for days at a time.

* * * *

A cable from the local to the London office of Rhodesia, Ltd., reports as follows on progress at the Sabiwa:—Good progress being made with development at Sabiwa Mine. Reef is exposed in all faces No. 2 level and No. 3 level. Now cross-cutting at various points to expose and sample whole body of ore. In north drive No. 3 level, at 10 and 15 ft. from shaft No. 4, samples have assayed as follows: 14½ dwts. and 12 dwts. respectively over hanging wall portion of reef exposed. No. 4 shaft is down 22 ft. below No. 3 level. Air compressor in course of erection.

* * * *

According to the Salisbury correspondent of the *Rhodesia Mining Review*, the mining community in the capital were somewhat perturbed last week by rumours that the Beatrice, the Asp, and the Planet-Arcturus mines were closing down. These rumours, however, were not founded on fact; although there can be no doubt that recent modifications in the operations at all three mines lent some colour to the conclusions that had been arrived at. The Beatrice has not actually ceased work, but there is little doubt that what work is now proceeding is preparatory to the abandonment of the property, whose ill-fated career must have cost its owners a considerable sum of money. In the case of the Asp, only a few men and boys remain on the mine, whilst, as regards the Planet-Arcturus, the rumour may be described as a silly invention. For many months past, as is well known, an active plan of campaign in the way of development has been proceeding at the great Enterprise district mine, with results that have been abnormally successful, and what gave rise to the absurd rumour is probably the fact that, in view of the large amount of ore already blocked out, the management have "slowed down" a bit.

* * * *

The greater part of the reduction plant for the Antelope mine has now arrived and is being rapidly transported from the Matopo terminus to the property. It is hoped that reduction operations may be commenced in September, but owing to there being absolutely no grass six miles beyond the Matopo terminus transport is most difficult to secure, and the fuel question is also affected to some extent by the practically unbroken drought in that particular district. There is, however, every reason to hope that the mine will be producing by the date mentioned.

* * * *

It is satisfactory to learn that the new railway line reached the Shamva mine about the middle of last month and that it will soon be taken over by the Railway Company, when it is hoped that a satisfactory time-table will be brought into force. Several train-loads of machinery are on the way from Beira to the property at the moment, and everything is in readiness at the mine to push construction work as hard as possible. Mr. Walker, lately chief mechanical engineer to the Globe and Phoenix mine, has been appointed construction engineer on the property. Mine developments: The following is the text of a cable sent to the London office of the Shamva Company:—"No. 4 level crosscut from winze No. 3, width is now 80 ft., averaging 5·5 dwts., continuing. In crosscut from winze No. 5, which is 220 ft. west of foregoing, reef now entered. First 5 ft., 4·2 dwts., continuing."

* * * *

Recent developments on the Falcon Mine on the sixth level have, we understand, been giving most excellent results, the full widths of the upper levels being maintained whilst the values have improved consistently in depth. Specifications have now been completed and tenders have been called for the necessary reduction plant, in fact, some of this is beginning to arrive whilst the foundations, which are being pushed on rapidly, are being got into shape. Tenders also will shortly be called for for the construction of a large dam to impound the flood water from the Blinkwater Stream. A contract was recently given out for the construction of a railway siding from the main line to the mine, which will deliver all supplies necessary.

* * * *

From the report of the Executive Committee of the Salisbury Chamber of Mines for the quarter ending December 31st last, which was adopted at a meeting of the Chamber held last week, it seems that its financial position is in every way satisfactory. At the end of last year there was a credit balance at the Bank of over £300, and a sum of £800 on fixed deposit with the Salisbury Board of Executors. Referring to the draft regulations of the Government to provide for the examination and registration of mine surveyors on the lines in force in the Union, the Committee express their approval of the proposals, but suggest that facilities should also be given to enable uncertificated mine surveyors to obtain the necessary status in this territory. Attention is also drawn to a circular issued from the Mines Offices in December last with reference to gases produced from the use of explosives, in which the mine inspectors recommend that proper ventilation should be provided in all working places, that fumes from blasting should be allowed sufficient time to disperse before putting men on to work, that broken rock should be wetted before lashing, and that downcast shafts should only be used as travelling ways wherever possible. It is also urged in the circular that the use of nitro-glycerine "chesa" sticks and gelatine tips to fuses should be discontinued, and that lighting torches, which do not emit noxious fumes, should be used instead. On the subject of excess areas the committee report that protracted negotiations have taken place between the Rhodesia Chamber of Mines and the Government, which, it is satisfactory to note, ended in the Government accepting the contention that the inspection certificate issued on a block of claims originally registered should include the inspection of an excess area. Accordingly, though an excess area, when discovered, must be registered in the books of the Mines Department, such excess will be endorsed on the registration certificate of the original block; but claim licences, when they fall due, will have to be paid in respect of the full number of claims shown on the amended certificate. As to the prospective revision of the mining law the committee report that, at a conference in Bulawayo in January, three representatives, Messrs. Pulbrook, Wells and Collings, were instructed to submit for consideration the following resolutions:—(1) This Chamber considers that the only satisfactory method of fixing royalties to be charged by the B.S.A. Company is a system of royalty on profits, such as is in vogue on the Transvaal mines, and that the Rhodesia Chambers of Mines should endeavour to obtain the consent of the B.S.A. Company to effect this alteration, failing which, this Chamber is of opinion that the system of royalty at present in force should be altered to provide for the charging of lower royalties on refractory ores, which are not amenable to ordinary treatment, and which require special and additional methods, thus entailing heavier capital expenditure and increased cost of metallurgical treatment. (2) This Chamber is of opinion that the law in connection with discovery pegs is insufficient, and that time should be allowed to the prospector to prove that a reef in place, or a valuable deposit exists. The law as laid down is not observed, and is difficult to enforce owing to the ambiguity of its provisions. The Committee have also had under consideration a communication from the Rhodesian Small Workers' and Tributors' Association, drawing attention to the continuous desertions of native labourers for whom capitation fees have been paid, and the ease with which, under the present Native Registration Ordinance, criminals can evade the law. The Association suggested that the Ordinance should be remodelled on the lines of the law in force in the Transvaal; and the Committee, having made representations on the subject to the Chief Native Commissioner, have been given an assurance that the various representations of public bodies would be considered in connection with the amended Pass Law which it is proposed to submit to the Legislative Council.

* * * *

The following is an official summary of a report of the London and Rhodesian Mining and Land Company received by mail:—" Radnor—Sinking below 2nd level resumed. Total sunk, 7 ft. Assays: East side, 11·4 dwts. over 36 ins.; west side, 11·6 dwts. over 36 ins. No. 1 crosscut south at ft. west drive—At 20 ft. a reef carrying high values was cut. Assays as follows: At 18 ft., 1 dwt.; at 20 ft., 76 dwts.; at 22½ ft., 1·2 dwt. Driving on this reef now started; s looking well. Downton—Winze started to cut reef below old stopes at a point 116 ft. from mouth of adit. ount Newman—No. 2 shaft—Crosscut commenced to cut et, which dipped out of the shaft. At 23 ft. in a quartz ringer was cut, but crosscut is being continued."

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THE PICKSTONE MINE, HARTLEY DISTRICT OF MASHONALAND

A Rhodesian Mine with Good Prospects—Increase in Equipment.

Prominent amongst the newer Rhodesian propositions—*i.e.*, mines that have recently come to the forefront in regard to production and profit—is the Pickstone, a Hartley district concern incorporated in Southern Rhodesia, July, 1912, and of which a full and detailed account appeared in this journal a few months ago. The Pickstone Gold Mines, Ltd., has a nominal capital of £50,000, of which £36,000 is issued. The declared policy of the concern is to distribute quarterly dividends, and the first of these—one of 7½ per cent.—was declared on October 31st last. The intention was to announce a dividend for the quarter ended January 31st, but in view of the prospects of the mine as disclosed by development operations the directors have deemed it advisable to increase the capacity of the reduction plant first contemplated by the expenditure of approximately £3,000 in addition to the £12,000 originally subscribed for this purpose. It was decided by the Board to meet this extra cost out of profits earned by the company, and therefore the dividend for the January quarter was passed. It is not anticipated, however, that it will be necessary to make any further inroads other than the £3,000 referred to above into the profits. The directors hope to be in a position to declare an interim dividend for the quarter ending April 30th, 1913, and thereafter regularly if nothing unforeseen occurs. It should here be of interest to note the milling returns for January and February list. In the former month two Tremains were at work for 25 days and 6 hours and crushed 514 tons. The total recovery was 674 ozs., or in value £2,772. In the month of February 576 tons were milled and the gold recovered was 575 ozs., or £2,420. Good profits are being earned and the development appears to be most satisfactory. An interesting ceremony took place at the mine on March 19th, when Miss Hamshaw, sister of Mr. Herbert E. Hamshaw, Chairman of the Board, started the new 10-stamp mill. It had been hoped that the full plant, consisting of 10 gravity stamps and two Chilian mills, would have been ready by that date, but owing to the impossibility of procuring certain indispensable portions of the new machinery in South Africa, the full plant will not be ready for another two or three months. Mr. Hamshaw, in a short speech, spoke in glowing terms of the future prospects of the company, and the substantial manner in which the new plant had been erected, which reflected great credit upon the manager and those under him. Mr. W. McD. Stokes, in the course of his reply, stated that the 10 stamps would be run as much as possible, but the running would, of course, be regulated by the capacity of the present cyanide plant and hoisting gear. He expected, however, that the new cyanide plant and electric hoist would be completed very shortly, and, with the arrival of the parts of machinery mentioned above, the full reduction plant would be in full swing. The development of the mine since the company acquired the property had fully justified the sanguine opinion expressed as to the value of the mine as a gold producer. Evidently the Pickstone has come to stay amongst the Rhodesian medium sized mines, and when the full new equipment is at work even more satisfactory profits than so far have been earned will, of course, be available for distribution.

RHODESIAN NATIVE LABOUR BUREAU.

Last Year's Results—Recruiting Suspended in Southern Rhodesia.

We have received a copy of the report of the Board of Management of the Rhodesian Native Labour Bureau, to be presented at the second ordinary general meeting in Bulawayo on April 21st. An outstanding feature of the report is the statement that out of the 11,742 natives supplied to the members during the year no less than 11,529 come from Northern Rhodesia, the southern territory contributing only 213. The report explains that it was decided early in the year to cease all recruiting in Southern Rhodesia, and in April, 1912, all Bureau recruiting agencies in Southern Rhodesia were closed. The reasons for this step were briefly:—(a) Local recruiting had fallen away very seriously in 1911 after reaching high-water mark in 1910; (b) employers generally express distrust and dislike of local recruiting; (c) local natives dislike engaging through the Bureau because they can obtain better terms if they proceed direct to the employers of their choice; (d) the distances to be traversed being comparatively short, there is little hardship to the natives in proceeding direct; (e) there was evidence that a preference for working on the Witwatersrand mines was gaining ground in the principal Southern Rhodesia recruiting fields (Ndanga and Chibi); and (f) it seems extremely probable that, acting conjointly, all these influences would so militate against success in recruiting as to lead to financial loss. There are now no recruiters working for the Bureau in Southern Rhodesia, and the apparent conviction in the minds of employers that they would benefit by such a cessation of Bureau operations in this territory will now be put to a test. The report contains some interesting reference to the various spheres of recruiting activity of the Bureau—to closed territories and to the prospects of obtaining labour from new areas. All efforts in regard to the opening of Nyasaland to recruiting proved unsuccessful, and the Board of Management admit that the Protectorate may therefore be looked upon as closed for the present as far as organised recruiting is concerned. The report continues as follows: The opening to recruiting of the Luangwa Valley, which was foreshadowed at the last meeting of the old Bureau, has resulted in 4,363 recruits being received from this area during the year, which must be considered as eminently satisfactory. The special medical camp at Fundu, where recruits are detained 10 days for examination, and to the upkeep of which a contribution of £2,000 per annum is made by the Government of Southern Rhodesia, has worked very satisfactorily. Your Board have had under consideration the question of opening up new territories for augmenting the native labour supply for Southern Rhodesia; and your chairman, Mr. H. W. Kempster, has opened negotiations with the Portuguese Government for permission to recruit in the districts of Tete and Quilimane of Portuguese East Africa. At the time of issue of this report, the negotiations had not been finally concluded. The importance of this matter can hardly be over-estimated. In November, 1912, the Bureau received notification from the Secretary for Native Affairs, Livingstone, that in consequence of the high death-rate amongst natives recruited by the Bureau in the Luapula Circle of North Eastern Rhodesia, His Honour the Administrator of Northern Rhodesia had directed that recruiting in that circle for employment on the mines of Southern Rhodesia would cease on 31st December, 1912. He would further not permit recruiting to recommence until all the natives received from that area to the mines had been repatriated.

MINING MEN AND MATTERS.

Mr. Samuel Evans has returned to the Rand.

* * * *

Mr. E. Birkenruth left for England this week.

* * * *

Mr. Charles Marx has gone on a six months' holiday.

* * * *

Mr. Russell Slack has recovered from his recent attack of enteric.

* * * *

His many friends will be glad to know that Mr. E. A. Wallers has recovered from his recent illness.

* * * *

The next monthly meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 21st April, 1913, at 8.15 p.m. The following papers will be open for discussion:—"The Occurrence of Sideroplesite and Ankerite in the Cassiterite Lodes at Rooiberg," by David P. McDonald, M.A., B.Sc.; "Note on the Origin of the Iridosmine in the Banket," by R. B. Young, M.A., D.Sc. (Edin.); "Structural Features of the Western Witwatersrand," by E. T. Mellor, D.Sc. (Lond.); "Notes on the Sea-Point Granite-Slate Contact," by E. H. L. Schwarz, A.R.C.S.; "Note on Diamonds in the Banket," by R. B. Young, M.A., D.Sc. (Edin.). The following paper will be read:—"Notes on a Section from Barberton to the Komati River," by David Draper (hon. member).

Specimen copies of the *South African Mining Journal* can be had from our offices at 125, Salisbury House, London Wall, E.C.

Kilo G.M. Co.

The Belgian Consul-General has written to the papers as follows:—During the last weeks several inquiries have been made at this Consulate-General *re* gold mining at Kilo (Belgian Congo), and I see now that the local Press is reproducing certain rumours which are bound to create a false impression as regards the true importance of those so-called goldfields. It might be of public interest to state the real facts in the columns of your valuable paper. The Kilo gold mine is situated about 75 miles westwards of Mahagi (Lake Albert). It does not belong to a private company, but to the State, and it is worked by Government officials. According to the Belgian Parliamentary papers, the output was 639 kilogrammes in 1911, as against 876 kilogrammes in 1910. The personnel of the mine in 1911 was composed of 30 white men and 2,500 boys. In November, 1911, a second mine was opened on the Government property, the Moto mine. According to the most recent information, the average output there was 14 kilogrammes per month, and 12 whites were employed with 1,400 boys. Let us now turn to the Belgian Colonial Budget for 1913. The chapter "Mines," which includes also the Government salt mines, gives 3,780,000 francs as estimated revenue, and 1,834,995 francs as estimated expenditure, leaving the estimated balance of 1,945,005 francs, less than £80,000 sterling. Another most significant figure is to be found at No. 24 of the "Budget des Voies et Moyens": Value of stock of gold in the Colony or at sea on January 1, 1913, 1,140,000 francs (£45,600). One can thus see at a glance that such a property would be considered here on the Rand as a very modest proposition. A traveller, Mr. C. Malloy, has expressed surprise at the prudent way the Belgian manager of the Kilo mine is guarding his "boxes and dishes full of gold." It never struck me as being an extraordinary thing. Here in Johannesburg, where the mines are certainly less exposed to danger than in the Congo wilderness, I never heard that a manager would let a visitor have free access to the ingots.

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SHAFT SINKING AT DAGGAFONTEIN

Progress of Sinking—Kimberley Reef Expected this Month—The Pumping Plant Described.

Rather outside the area of concentrated activities on the Further East Rand section, and yet falling within the limitations of that vast annexe of the Central Rand which each month is assuming a measure of greater industrial importance, is a proposition of considerable possibilities, to which a comparatively small amount of local attention has been directed. We refer to the Daggafontein Gold Mining Company, Ltd., a concern having head offices in London, but controlled locally by the house of Henderson. Reference to a map will show the position of Daggafontein in relation to the surrounding properties. The farm is situated to the south-east of Geduld and south of Welgedacht, with the farm Grootvlei sandwiched between Welgedacht and Daggafontein.

Shaft Down 2,080 feet.

The special feature of interest in connection with the property at the moment is that the seven compartment vertical shaft has now reached a depth of 2,080 feet, and that it is expected the Kimberley Reef series will be intersected some time this month. The estimated depth to the Main Reef below the horizon of the Kimberley series is 1,400 feet, and, since sinking is proceeding at the rate of about 100 feet per month, it may be expected that the Main Reef ore body will be cut some time next year. As a matter of fact, this rate of sinking should be improved on, since an electrical pumping plant of substantial capacity is about to be installed. Water is at present being baled out, but, when the new pumping installation is at work, one compartment will be relieved of baling duties and will be available for hoisting more rock.

Borehole Results

It should here prove of some interest to recall the results secured in the boreholes. At bore No. 1, north-eastern corner, the Van Ryn series was intersected at a depth of 3,275 feet, 5½ inches assaying 1 oz. In the joint Grootvlei bore No. 2 to the north of the property, the Van Ryn series was encountered in 1905. Omitting the quartzite parting, which in working probably would be sorted out, the remainder of the reef averaged approximately 7 dwts. over 32·3 inches. The leaders were also assayed, but contained no gold, with the exception of the top one, which contained a trace. After survey, the actual depth, allowing for deflection, was estimated to be 4,880 feet, and, on the reef width being corrected to dip and deflection, the width of 32·3 inches works out at about 28 inches. Bore 3, at the south-east corner of the property, sunk jointly with others, intersected Kimberley Reef at 2,117 feet, 8½ inches of core assaying 19 dwts. It was stopped at 2,627 feet. Bore 5 intersected the Kimberley Reef at 1,946 feet, showing about 31¼ dwts. over 2½ inches. Continued down, it entered a massive body of diabase, and was discontinued. Bore 6, just to the north of bore 3 at the south-east corner of the farm, was reported, November, 1905, to have encountered the Van Ryn series at about 3,100 feet depth, showing 11 dwts. 9 grs. over 23¼ inches. Bore 7, midway between bores 1 and 6, at 2,102 feet met Kimberley Reef—7 inches, 18 dwts. In February, 1908, the Van Ryn series was encountered at a depth of 3,561 feet, showing 24·58 dwts. over 6 inches.

The sinking of the No. 1 seven compartment shaft, referred to above, and situated near the No. 7 borehole, was commenced in September, 1910, and at the end of November last the depth attained was 1,597 feet. As stated above, the present depth is over 2,000 feet. The mining area of the company apparently will be in the neighbourhood of 1,257 claims, and, provided the development values are satisfactory, the company should be able to keep a mill of substantial size—say 200 heavy modern stamps, plus tube mills—at work for some years.

The Pumping Plant.

The pumping installation will consist of a seven stage No. 7 Weise and Monski high lift centrifugal pump direct coupled to and fixed on a common base plate with a Swedish General Electric Co. 2,000 volt motor running at 1,450 revolutions per minute, the drive being by means of a flexible coupling. The duty of the pump is 333 gallons per minute against a total head of 820 feet, the guaranteed efficiency being 70 per cent. The actual horse power required is therefore 117, and the horse power of the motor is 130. The special feature of this pump is the special system of balancing end thrust, half the stages working in each direction. This renders possible the system of tightening rings, which is adopted, which are similar to labyrinth packing. These labyrinths enable an extremely long clearance to be used without lengthening the pump, and as this clearance is long it need not be very narrow, so that the length of time these pumps can run without renewing the bushes is considerably prolonged. This system of construction is unique and is, we believe, used by no other turbine pump builders.

A SATISFACTORY YEAR AT THE NEW UNIFIED MAIN REEF.

Mining Policy and the Question of Life.

The year's operations at the New Unified Mine have yielded results of a very satisfactory nature. The quantity of ore crushed was increased by 10,000 tons, and the total gross profit amounted to £60,634. The tube mill, which was put to work in the latter part of 1911, was mainly responsible for the increased tonnage, and the returns also benefitted considerbly by reason of the improved extraction obtained from the finer grinding of the rock. Although the average value of the reef sent to the mill was .226 dwt. lower than that for 1911, the recovery value showed an increase of .639 shillings per ton. The quantity of accumulated slime treated was reduced by 5,589 tons. This was due to the plant being called upon to treat a greater quantity of current slime. The profit from treatment of accumulations amounted to £2,791, as compared with £4,949 for the year 1911. The main incline shaft was sunk to its final depth of 2,638 feet. Now that shaft sinking has been completed, there will be very little capital expenditure to be incurred in the future, and practically the whole of the gross profits will be available for distribution. Professor J. G. Lawn, in his report, states: Steady progress was made with the development of the mine. The Main Reef Leader drives continued to expose ore of highly satisfactory value. It is most likely that the development of this reef will be completed during the current year, as the 13th and 14th levels are well advanced, and there is only the 15th level west remaining to be driven. As the amount of work on the Main Reef Leader lessened, greater attention was paid to the opening up of the South Reef. Some good values have been exposed at several points on this reef, and its development has contributed a fair tonnage of the payable ore reserves. Our mining policy in the future will be to reduce as far as possible the percentage of Main Reef Leader mined, and to increase the amount of South Reef. It will also probably be found that a quantity of Main Reef will be available for the mill. This policy will undoubtedly tend to a slight lowering of the grade, but it is hoped, by increasing the tonnage milled and by reason of the smaller amount which will require to be spent on development, that the profits will not be greatly affected. On the other hand, the life of the mine should be proportionately increased. In this connection, it should be noted that a certain amount of exploratory work, which has been carried out recently in the upper levels of the mine, has shown that patches of payable ore have been left behind. It is probable that at the time this section of the mine was being worked, this reef was looked upon as of too low a value for stoping, but with working costs at their present level it will well repay the cost of mining. A re-estimation of the ore developed was made at the end of the year, and it was calculated that the payable reserves amounted to 275,028 milling tons, of an estimated recovery value of 6.4 dwts. Mr. E. A. Douglas, the manager, in the course of his report, shows that working costs were at the rate of 21.269s. per ton.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal —Views, Suggestions and Experiences of Readers.

British Income Tax and South African Residents.

To the Editor, *South African Mining Journal.*

Sir,—As considerable doubt exists in the minds of persons residing in South Africa as to the claims that can be made for repayment of British income tax deducted from dividends derived from British or foreign sources, permit us to put before them the claims that can be made, as to a large number of residents substantial sums are due:—(1) Claims in respect of tax deducted from interest or dividends payable in the United Kingdom on foreign or Colonial Government and other securities, stocks, etc., irrespective of the total income. (2) Claims for abatement of tax deducted from dividends or rents from the United Kingdom, provided that the claimant is, or has been, employed in the service of the Crown, or is employed in the service of any missionary society abroad, or any of the native States under the Protectorate of the British Crown, or is resident abroad for the sake of his health, and that the total income from all sources does not exceed £700 per annum. As many claims must be lodged before the 5th October next the question calls for immediate attention.—Yours, etc.

For the TAX ADJUSTMENT (SCARFF'S) AGENCY,
E. MONTAGUE.

386, Oxford Street, London, W.,
March, 1913.

The White Labour Question as Affecting the Mining Industry.

To the Editor, *South African Mining Journal.*

Sir,—Correspondence appears in your columns as touching the subject of white labour; one of your correspondents appears to be rather pessimistic as to the probable effects to the mining industry, owing to the fact that many miners contemplate leaving the mines during the next six months, no doubt owing to the new regulations as to those affected with miners' phthisis. It must be looked forward to that the mines must lose a great many of the older miners. The question then is one for the mining houses to consider, as to the best way to find men to replace these incapacitated miners. The only sound plan to adopt is that all the mines should have a good reserve of learners coming on to take the place of men leaving; an assiduous attentive learner is a valuable employee to a mine, as at the end of three months a man that has shown ability and carefulness is qualified to obtain a provisional certificate, and can thus undertake the work of a contractor or stoping miner. But to make the berth of a learner sufficiently attractive, the wages to start with must be considerably more than at present, viz., a wretched 5s. per day! If the mines will pay a starting learner at the rate of 10s. per day, and thus give a man a chance to learn the art of mining, and in doing so to keep himself in fairly comfortable circumstances, there are hundreds of men that will to-day go down the mines. Let there be no restrictions as to age, provided the men are sound and healthy; it must be borne in mind that during his period of probation the learner can be put to any job underground, so in case of any shortage in any department the learner is always at hand. This feature connected with the mines is one worthy of the serious consideration of mine managers. Turning to the subject of an all white labour policy for the mines, there is much to recommend the adoption of such a policy, the great obstacle to its adoption at present being the very important item as to the quality and character of the white labour, either on offer or that would possibly offer itself in South Africa to-day. I do not for one moment suggest that the companies must fill their mines with all sorts of rubbish in the shape of so-called "white workers" simply owing to the fact that they were born white men. We have seen some of these specimens of humanity go down a mine for one shift, and finding the work not quite as congenial as they anticipated, they did not go down again. Any industry depending on such a class of labour most assuredly cannot be blamed for not continuing its employment. But on the other hand, with an intelligent economic supply of white labour, the mines can be worked on the lines of white labour, in the vast majority of its departments, and this to the advantage of the mining industry, as well as to the community at large. Under the now improved conditions of work underground, such conditions would continue to improve with an all round introduction of white labour, as the segregation of the unhealthy Kafir from the area where he originally worked, abolishes a very dangerous microbe as affecting the health of the white mining employee underground. The important question as to all mines holding a strong reserve of competent learners as future miners most recommend itself to mine managers. Yours, etc.,

"A WOULD-BE LEARNER."

April 6th, 1913.

White Labour and Underground Conditions.

To the Editor, *South African Mining Journal.*

Sir,—Your issue of the 5th inst. contains another verbose and not over-lucid communication from that correspondent hiding under the anonimity of "Underground Worker." Your correspondent either has but doubtful faith in, or lacks the courage of, his convictions. The man who indulges in invidious personalities and derogatory aspersions under cloak and cover of a "nom de plume," forfeits all claim to our consideration. Had he confined himself to his theories regarding mining, the fact of his choosing to remain anonymous would have been a matter of no moment, but to make calumnious insults and accusations from behind the safe refuge of a pen-name can only be described as cowardly. I do not refer to his fatuous attacks on myself, but to the imputations of cowardice and ingratitude which he directed against Cornishmen for their behaviour during the War, though happily his accusations are too palpably groundless and absurd to be credited. That Cornishmen left the mines when hostilities commenced, I gladly agree; that they were in any way actuated by cowardice or ingratitude I emphatically deny. Assuming that "Underground Worker" is a Britsher, would he have had them stop to protect the mines for the capitalists and the Boer Government against their own countrymen? Does he consider them under any obligation whatever to the mines? If so, let him recollect that it was largely they who had made the industry what it was, and further, that for every pound they had received as wages probably five pounds found its way into the coffers of the capitalists and the Dutch Government. If he still holds to his opinion in face of these facts I can only say that his sense of patriotism is sadly perverted. That Cornishmen were not tardy in responding to their country's call is attested by a mournful monument in almost every Cornish town and village, bearing mute testimony to the numbers of brave men who "recked not the cost but simply fought and died." In future I would advise "Underground Worker" not to let the petty prejudice which he seems to foster against Cornishmen get the better of his manners and veracity. Regarding the Cornishman's ability as a miner I can only reiterate what I said before, i.e., that taken as a class, Cornishmen are the most efficient miners who come to the Rand, not from any inherent superiority over other classes, but because their predilections and the training and experience they have received from their youth up, all conduce to make them peculiarly fitted to the particular conditions which exist on the Rand. The iron and coal miner, on arrival here, enters upon a system of mining with which he is unfamiliar, whilst the Cornishman, by his experience under analogous conditions can easily adapt himself to the slight modifications and differences which he encounters.

"Underground Worker" either wilfully or by reason of obliquity of his mental vision, seems determined to construe into a contradiction my previous remarks that to become a thoroughly proficient miner entailed a lifetime of application, and that the average period of a miner's usefulness here is ten years. How, he triumphantly inquires, can a Cornishman or any other man become proficient under these circumstances? Were it not for his—to use an Americanism—pinheadedness he would have seen that the very point I emphasized in one of my previous letters was that Cornishmen had already a lifetime of experience before coming to this country—the majority going underground at about the age of fifteen.

I am much gratified to note that your correspondent's ideas of the duties of a miner have undergone a complete and radical change, for last week, instead of his former summary of a miner's duties, viz., "marking the face and sleeping on the box," he gives us a harrowing description of life underground, 18 hours shifts in an inferno of smoke and dust.

In advocating the merits of the white labour policy, "Underground Worker" has confined himself chiefly to nebulous generalities, but such as is definite and concrete enough I will endeavour to deal with. The time is ripe, he says, for the adoption of white labour under the improved conditions which exist. That conditions have improved I do not deny, but the improvement only operates to the effect that a man may work a year or two longer before being relegated to the Rand's human scrapheap. If the improvement is so marked, why is it that the best miners are leaving the Rand by hundreds, and why is the labour supply becoming increasingly inadequate? The use of water, no doubt, ameliorates the evil, but the dust caused by drilling and shovelling is only a fraction of the amount in circulation by far the greater quantity being the result of blasting, and we have to rely on the natural attraction of gravity to get rid of much of this. I am employed on a mine generally regarded as a health resort compared with a great many of those on the Rand, yet I have never seen the air completely free from dust, and usually inspection by an acetylene lamp reveals dust particles in an abundance, which would never be suspected by the naked eye. Underground conditions have not improved in such a measure as to warrant any radical change in the labour or any other policy.

One statement your correspondent made on the subject was, for him, particularly definite. One white man, he says, can do the work of three Kaffirs. Without wishing to accuse "Underground Worker" of intentional mendacity, I must say that such an assertion would be very much open to question at any time, but at present, considering the increasing efficiency of the native and the tendency to deterioration amongst the whites, his contention is an absolute fallacy. Would "Underground Worker" care to do the work of three natives in the narrow stopes of the Randfontein and Roodepoort districts, which means that he would have to drill three holes of an average depth of three feet, and, assuming each hole to break 12 cwt. of rock, to shovel this into the box all within the space of eight hours? Under such circumstances I am inclined to the opinion that his white labour theories would undergo the same rapid reconstruction which he has evidenced in other matters. Regarded from an economic standpoint the sophistry of his pronouncement is even more evident. The number of natives employed on the mines is approximately 200,000, and these receive in wages £6,000,000 per annum, which works out at an average of £2 10s. per boy per month. Even were this amount doubled to allow liberal provision for cost of food, accommodation, etc., reckoning on a basis of three Kaffirs to one white £15 per month is much too small to lure any of the "million Britishers" he speaks of so airily, leaving the extra labour out of the question. Let me remind "Underground Worker" that those who run these mines do so from no altruistic motives, they are actuated solely by the desire for dividends; white labour has been tried, and has been found wanting. If ever it comes, it will probably be about the same time as the millenium, and will have no interest for us. "Underground Worker" admits that he has forgotten a great deal about mining, so I would advise him, having regard to the weakness of his memory, to quit the stony paths of newspaper correspondence.—I am, etc.,

M. ROACH.

ANSWERS TO CORRESPONDENTS.

"Shareholder."—Your letter has already appeared in other papers, and has been replied to by the company.

W. Wunderling.—We have no information regarding the concern you ask about. The vendors as well as the company itself occupy the same office. We understand that a Mr. Weston was representing the company in Rhodesia.

THE MODDERFONTEIN GOVERNMENT GOLD MINING AREAS.

Northern Shafts Reach the Reef—An Efficient System of Ventilation Ensured.

Mr. J. G. Lawn, the consulting engineer of this company, in his annual report, writes:—During the past year the two northern shafts on your property have reached the reef, and have been completed. The two southern shafts have also made steady progress, and it is hoped that the south-east shaft will reach the reef at an early date. The starting of the south-west shaft was hindered owing to shortage of native labour, but it is hoped to complete it by about the middle of this year. Details of depths are given in the manager's report. Development is now under way at the north-west and north-east shafts. The west drive at the first level from the former shaft has exposed ore of good average value, and a portion of the northern incline was in payable ore. The east drive has been in faulted ground, and though some decent values have been met with, on the whole the ore exposed in this drive was unpayable. The southern incline is above the reef. At the depth of 435 feet the reef has recently been intersected by a short cross-cut from the incline; the value obtained was 33.6 dwts. over 10 inches. Very little development was done from the north east shaft, and the values met with were irregular and barely payable, as will be seen from the manager's report. However, since the end of the year the values in the main drive east and west have been better. For the month of January the east drive was extended 102 feet on reef of an average value of 14.7 dwts. over 15 inches, and the west drive was driven 169 feet on reef averaging 12.7 dwts. over 20 inches. Up to the present only a very small area of your immense property has been touched by development work. It is to be expected that the nature of the reef will be similar to that of the reef in all the surrounding properties; that is to say, that payable areas will alternate with unpayable zones, and on the whole the results so far obtained may be looked upon as encouraging. If development produces satisfactory results, it is hoped that in some twelve months' time we shall feel justified in commencing the erection of a reduction plant. Every effort is being concentrated on reaching the producing stage at the earliest possible date. In the laying out of the mine workings care has been taken to ensure an efficient system of ventilation, and also to provide an adequate water supply and appliances for laying dust. In this way it is hoped to make the mine healthy to work in, and to avoid as far as possible all danger of miners' phthisis. Attached to the report of Mr. F. Graham Bell, the manager, is an interesting tabular statement showing the monthly depths sunk in the four shafts, together with the costs of sinking. We comment on this table elsewhere in this issue.

ROOM AT THE TOP

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine-drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics. → E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, corner Eloff and Pritchard Streets; Box 2061.

THE POSITION OF THE NEW KLEINFONTEIN.

Life of the Mine—Development Results—A Favourable Year Anticipated.

THE consulting engineer's report on operations at the New Kleinfontein for 1912, which accompanies the directors' report and accounts, states that the value of the ore exposed during the year was 7.33 dwts., as compared with 6.31 dwts. for 1911. It will be noticed, however, that the eastern and central sections were responsible respectively for 31 per cent. and 47 per cent. of the ore developed during 1912, as compared with corresponding figures of 15 per cent. and 37 per cent. during 1911; and, on the other hand, the western section only contributed 21 per cent. of the total in 1912, as against 45.7 per cent. in 1911. As the eastern and central sections are both distinctly higher grade than the western section, it follows that the increased value of development during the year is due to development being advanced more rapidly in the former sections during 1912 than in 1911. The bulk of the undeveloped ground of the mine lies in the eastern, Orient and central sections, so that there is no necessity for forcing development in the western section. Taking the sections separately, the comparative values of the ore developed during 1911 and 1912 are as given in the following table :—

	Value of ore developed. 1911. dwts.	1912. dwts.
Eastern section	8.27	8.39
Central section	8.61	7.42
Western section	3.95	5.66

The eastern section is thus maintaining its value, while the central section shows a considerable decrease in value. The western section improvement is due to selective development rather than to any all-round improvement. The payable ore reserve at the 31st of December, 1912, amounted, on a milling basis, to 1,190,663 tons, of an average value of 7.59 dwts., an increase in tonnage of 41,000 tons and in value of 0.1 dwt., as compared with the figures for the year ended the 31st December, 1911. The value of the ore reserves as shown above will justify a mill bin value of approximately 7.0 dwts., due allowance having been made in assessing this value for development ore and ore from sources not included in the above reserves. The development position of the mine has been well maintained during the year, and future prospects, as regards the eastern and Orient sections (containing the largest undeveloped area), are decidedly promising. Little or no improvement can be expected in the western section, but the central section should continue to furnish fair grade ore. In the eastern, Orient and central sections the ground is much faulted and broken up by dykes in the deepest workings. The completion of the sinking of the Orient vertical shaft and the progress of development in the Orient section.—The sinking of the Orient main vertical shaft was completed during the year, the total depth of this shaft being 1,888 feet. A station has been cut at the plane of the eleventh level drive of the New Modderfontein Company, and a connection has been made with that company's workings. Preparations are now being made for the sinking of the main incline shaft, and a considerable amount of development should be effected in this section during the current year. Development operations during 1912 were retarded by the necessity of completing the permanent works and by the numerous dykes encountered in the workings. The main reef was partially exposed for a distance of 285 feet, of which 215 feet were payable, assaying 4.27 dwts. over a stoping width of 56.71 inches. I anticipate that complete exposure of this stretch of reef will result in a considerably higher average value being obtained, as the upper main reef, where exposed, gave an average value of 7.34 dwts. over 42 inches. On the south reef 339 feet were sampled, of which 201 feet were payable, assaying 6.29 dwts. over a stoping width of 45.86 inches. No development was executed during the year in that portion of the Orient section which is to be worked from the New Kleinfontein eastern subsidiary shaft. The locality in question will be developed in the ordinary course of events by the drives from the eastern subsidiary shaft, and there is at present no necessity for advancing these into the Orient ground at abnormal speed. In general, it may be said that development in the Orient section during the year was too restricted to permit of any conclusions being drawn from the results thereof; but I consider that, when taken in conjunction with previous results, as detailed in my report for 1911 (56,578 milling tons averaging 8.91 dwts.), coupled with the uniformly good results obtained by surrounding companies, they indicate that this section will at least equal in value the old eastern section of the New Kleinfontein mine. The additional plant was taken into commission towards the end of May, 1912, and since then it has run continuously and most satisfactorily. A comparison between the results obtained by the enlarged plant (stamps and tube mills), as against the results of the original equipment—stamps only—is of considerable interest. The periods chosen for comparison are October, 1908, to March, 1909, and October to December, 1912. During the former period the old plant was working at the normal capacity of the cyanide works, and during the latter period the enlarged plant was in full commission and working normally. With regard to the reduction costs per ton milled, it should be noticed that the figure given for the original plant (4s. 2.261d.) includes an amount of 1s. 0.661d. for maintenance of all surface plant, which item was formerly kept separate in the costs. It therefore follows from the statement given below that the original plant was comparatively more efficient in every way than the figures themselves show :—

	Reduction Cost per ton.	Headings Value.	Tailings Value.	Percentage Extraction.
Original plant (stamps) ...	4/2.216	8.648	0.364	95.79
Enlarged plant (stamps and tube mills)	4/5.695	7.039	0.350	94.60

The above statement shows that the stamp and tube mill combination cost more per ton milled, and made a poorer extraction than the stamps alone, thus bearing out my contention with regard to the ore of this mine that stamps are more efficient than a combination of stamps and tube mills. The decision to employ tube mills at Kleinfontein was entirely due to the fact that the site of the battery was unsuitable for erecting additional stamps. I hope that during the current year an improvement in the extraction will be affected. In the circular to shareholders, dealing with the acquisition of the Orient claims, dated the 20th January, 1910, it was stated that the total claim area of your company, including the Orient section, would be worked out in eighteen years from January, 1911, allowing for the increase in reduction capacity. From the information which has been gained since that date in the course of development in the old claim area of the company, certain facts were disclosed which made it necessary to somewhat modify this estimate of life. The principal modification was in connection with the assessment of the pay tonnage in the western section of the mine. During the last two years developments show that in this section both the main reef leader and the upper main reef have entirely disappeared, and that very nearly the whole of the development on the main reef in that section during this period was unpayable. It was always hoped, however, that with further exploration payable values might be again encountered, but the progress of development has shown that there is little reason to believe these hopes will be realised. In the eastern section no main reef leader has been developed during the current year, and the intrusion of a number of dykes, of which previous exploration and knowledge of surrounding conditions had given no indication, has rendered necessary an increase in the estimate percentage of loss of ore due to these. I have in consequence based the estimate of this loss at 12 per cent. instead of 6 per cent., the figure formerly adopted. At the 1st of January, 1911, I estimated the life of the mine at eighteen years, and owing to the lapse of time the life would now be sixteen years had I been able to confirm my previous figures. Owing, however, to the facts disclosed during the last two years, I have arrived at the conclusion that the available milling tonnage has been reduced by 1,800,000 tons, and, taking into consideration the present capacity of the plant, the life is reduced by three years, bringing it down to thirteen years as at the 1st of January, 1913. I would point out that as a mine approaches within measurable distance of the termination of its life, frequent revision of the estimate of that life becomes necessary. If the present rate of development be maintained it will be possible in two or three years' time to obtain sufficient data with which a more accurate estimate can be made; and it would then be possible to calculate the life with a considerable degree of precision. I wish, however, to point out the great difficulties in the way of making an assessment of this kind. I know of no case on the Witwatersrand goldfields where an estimate of the life of a mine has been verified. The actual result has always been in excess of the estimate. In conclusion, I have every reason to believe that the working results of this year will surpass those of the year under review.

Situations Wanted.

Advertiser, many years mining experience, Transvaal Managers Certificate, seeks position in Rhodesia or elsewhere to take charge of or to assist on Gold Properties.

"D 84," Central News Agency.

TO MINE MANAGERS.

A practical and scientific miner, an expert in all branches of the profession, holder of mine overseer's certificates, coal and gold, seeks position as SHIFT-BOSS. Experience, 11 years Welsh Collieries, 19 years South African. Single, strict T.T., age 42 years. Interview granted. Apply Box 3637, Johannesburg.

CONSOLIDATED LANGLAAGTE.

The New Plant—Year's Gross Profit, £123,939—Ore Reserve Position.

The most notable feature in connection with the year's work at this property was the starting up of the new reduction plant, and naturally a considerable amount of space is devoted to a description of the equipment in the technical reports. Professor Lawn, in his report, writes:—

During the first six months surface construction and underground work were pushed ahead with all possible speed with a view to starting the new plant at the beginning of July. Unfortunately the requisite electric power which we had arranged to obtain from the Victoria Falls and Transvaal Power Company, Limited, was not available until the 30th September, so that the whole of the new plant remained idle for three months. This involved your Company in a heavy loss, and a claim for compensation will be lodged with the Power Company. Crushing was continued with the old plant until the end of September, and the new mill was put into regular operation on the 1st October. At this date our native labour force had practically reached its lowest point for the year, and operations for the ensuing two months was considerably handicapped. A pronounced improvement was recorded in the returns for December, and it may be mentioned that for the past month (January) the tonnage milled amounted to 44,500 tons, which is very near the estimated capacity of the plant. It should, however, be mentioned that practically no sorting was done. There is no doubt but that sorting on this mine is a more difficult problem than on some of the mines on the Rand, and as it was not possible with the old plant, it is difficult to get it started in the new. It is, however, hoped that with careful attention sorting will be possible, and that considerable advantage will accrue to the grade. The quantity of ore crushed during the year showed an increase of 43,535 tons as compared with the 1911 tonnage, and the gross profit of £123,939, was higher by £39,272. Development operations have been attended with very satisfactory results. Very little driving was done at the Croesus Section, but a considerable footage was accomplished at the Star Section, where a large tonnage of payable ore was exposed near the western boundary. At the Southern Section values to the west of the West Shaft have been disappointing, but both the eastern and central portions of this section have been proved to contain a high percentage of payable ore. This remark applies equally to South Reef and Main Reef Leader. A recalculation of the ore reserves was made at the end of the year, and it is estimated that the total payable reserves in all sections of the mine amounted to 2,069,630 tons of an estimated recovery value of 6.4 dwts. The tonnage and value are calculated on stoping widths, but it is hoped to carry out a certain amount of sorting, and if this is accomplished the tonnage will be reduced and the value increased in proportion to the reduction in tonnage. Capital expenditure during 1912 was naturally a heavy item, in view of the new surface plant, and the development and equipment of the Southern Section of the mine. The total amount expended was £318,968, of which £189,298 was spent on surface construction and £129,670 on underground work. By the end of the year the expenditure on surface equipment was drawing rapidly to a close, and, as the work is well advanced underground, capital expenditure will assume normal proportions, and the bulk of the profits earned will be available for distribution. The Consolidated Langlaagte mill is the first to come under the operation of the Mines and Works Act of 1911, which provides for the stoppage of milling operations on Sundays. The plant was designed to cope with this restriction so far as tonnage was concerned, but there are other factors which call for consideration, and which introduce serious difficulties as a result of interference with the continuous running of the plant. Chief amongst these may be mentioned the elaborate system of cone classification, which has become essential to the efficient operation of tube mills. A statement was submitted to the Sunday Observance Commission on this subject, and towards the end of the year application was made to the Government Mining Engineer under Section 6 (c) of the Act for permission to run on Sundays on the ground that "the reduction plant constituted a continuous metallurgical process, a stoppage of which during the whole of one day prevented its immediate resumption on the next succeeding day and diminished the effectiveness of the process." This application was refused, and no further steps have been taken in the matter. Apart from the difficulties referred to above, it is gratifying to record that the new plant has run most successfully, and there is no doubt that by its means considerable economies will be effected in surface costs. The finer grinding of the ore brought about by the tube mills has been the means of reducing the value of the residues to a very low figure, the average assay value of which during the period the plant has been in operation being only .260 dwts. Your mine has now an efficient surface plant, and as the ore reserves stand at such a satisfactory figure there is every reason to look forward to a prosperous future. The problem of miners' phthisis has received very careful study during the year. No expense has been spared in carrying large quantities of water underground, and in providing suitable appliances for distributing it at every point where it is required to lay the dust underground. It is gratifying to note that both officials and workmen are now much more earnest than formerly in seeing that the appliances provided are regularly and systematically used, so that there is a strong hope that this scourge will be very materially lessened, if not eliminated, in the future.

In the report of the Manager, Mr. A. E. Payne, it is shown that the total revenue from gold was £380,693, or 25·8s. per ton. Working costs were 19·063s. per ton, leaving a working profit of £99,446, or 6·74s. per ton. The gross profit for the year was £123,939.

THE YEAR WITH THE GINSBERG.

An Increase in Profit—Improvement Mainly Due to Tube Milling.

There was a considerable improvement in the results at the Ginsberg Mine during 1912. This was mainly due to the tube mill, which was put to work in January, and as a result of which the quantity of ore crushed was increased by 29,463 tons as compared with the tonnage milled in 1911. The extraction was also improved, and the revenue from gold was increased by one shilling per ton. These factors, combined with a reduction in working cost, all helped to swell the gross profits, which amounted to £83,448, being an increase over the previous year of £21,104. Mr. J. G. Lawn, the Consulting Engineer, in his report, states: Development operations were practically confined to the North (Balmoral) Section, and taken as a whole the work carried out has shown the position underground to be of a highly satisfactory character. The north shaft was sunk 292 feet, and the ninth level drive east was started, and has exposed reef of fair value. A large tonnage of ore between the fourth and fifth levels, which formerly was of doubtful value, has been proved to be payable, and certain areas in the old workings have been opened up, and have been found to contain blocks of ore of good value. The ore reserves were re-estimated at the end of the year, and it is calculated that the payable reserves amount to 346,681 milling tons, of an estimated recovery of 6.9 dwts. There is an accumulation of slime in the old Balmoral dam amounting to some 60,000 tons. The question of installing the requisite machinery to treat this accumulation has been under consideration for some time past, and it has now been decided to erect a small plant which will enable 750 tons of slime to be treated per month. The plant has been ordered, and when it is put to work it is anticipated that a slight additional profit will be derived from this source. Mr. Erroll Hay, the manager, in his report shows that the revenue from gold was £252,533, or 30s. 0.77d. per ton. The working profit was £80,657, and working costs were at the rate of 20.471s. per ton.

Piggs Peak.

The following are the results of operations at Piggs Peak for March: 25 stamps ran 27¼ days, crushed 3,033 tons, yielding 535 ozs. fine gold. Cyanided 2,690 tons, yielding 389 ozs. fine gold. Concentrates shipped 4¾ tons, containing 133 ozs. fine gold. Total, 1,057 ozs. fine gold, value £4,471. Recovered from outside sources, gold value £840. Total costs, £2,489. Total profit, £2,822.

Ocean Freight on Bullion.

The terms of the agreement embodying the proposed reduction in the present freight rate on raw gold, so far as the gold mining companies are concerned, are agreed upon. There is still one point of difference outstanding between the Union-Castle Mail Steamship Company and the banks, which it is anticipated may be settled shortly, when the agreement will be forwarded to Johannesburg for signature.

WITWATERSRAND: A RECORD YEAR.

Development of the Southern Section—Profit Improves by £57,701.

The year 1912 has been a most successful one in the history of the Witwatersrand Company. Operations at the mine were restricted to a slight extent at the commencement of the year, owing to a shortage of native labour, but this difficulty proved to be of a temporary nature, and there was a steady improvement in the returns month by month. The quantity of ore milled showed an increase of 37,690 tons, as compared with the tonnage crushed for 1911, and the gross profit for the year amounted to £231,394, being an increase on the previous year's profit of £57,701. Working costs were about eightpence per ton higher; this was due to more careful and cleaner mining, and also to an increased amount of development being accomplished. The Consulting Engineer's report states: Excellent progress was made with the sinking of the vertical shaft, and the reef series was intersected in October. The South Reef was encountered at a depth of 2,232 feet, and assayed 3.15 dwts. over 67.3 inches. At 2,243 feet, the Main Reef Leader was encountered, its assay value being 2.38 dwts. over 9.1 inches. It will be seen that the values are below the pay limit, and more recent development has shown that they are not a correct indication of the average value of the reef in this neighbourhood. The remainder of the year was occupied in cutting a station and sump, and driving on reef was not started until near the end of January. At the date of this report, 90 feet of driving on the South Reef had been accomplished, and for this distance a width of 48.1 inches of reef gave an assay value of 7.8 dwts. A winze is being sunk from the 14th level northern incline shaft to connect with a cross-cut from the vertical shaft. At the end of January the winze had attained a depth of 91 feet, the average value of the reef for this distance being 12.1 dwts. over 61 inches. Development operations were directed mainly to the southern section of the mine, and large bodies of payable ore have been exposed at the plane of the 13th and 14th levels. A number of small dykes have caused a displacement of the strata in the vicinity of the 13th level, with the result that the reef series has been triplicated, and three separate levels have had to be driven at the same horizon. The sinking of the northern incline shaft was discontinued some distance below the 14th level. It is not intended to sink the shaft further, as the ground below this point can be more cheaply opened up by means of a cross-cut from the vertical shaft. A revaluation of the ore reserves was made at the end of the year, and the tonnage of ore developed was calculated to amount to 1,331,540 milling tons of an estimated recovery value of 6.1 dwts. Main Reef footwall to the amount of 213,804 tons has been included in the reserves. Owing to insufficient data, the footwall was not taken into the 1911 reserves, but it is worthy of note that of the ore mined for 1912, over 30 per cent. was obtained from this footwall. In view of the satisfactory position underground, it has been decided to proceed with the installation of five tube mills with the necessary extension to the slime plant. By this means it will be possible to reduce the value of the residues and also increase the tonnage crushed. The work is now in hand, and when the plant is put into operation there is every reason to anticipate a further improvement in the profits. Capital expenditure on the mine has been a heavy item during the past two years. This was unavoidable on account of the opening up of the southern section. The additions to the reduction plant outlined above, together with the equipment and sinking of the south incline from the vertical shaft, will necessitate the expenditure of a considerable sum of money during the current year, but in 1914 capital expenditure should be considerably reduced, and the bulk of the large profits realised should be available for distribution as dividends. A considerable amount of work was accomplished during the year in improving the conditions underground so as to get rid, as far as possible, of the causes which lead up to miners' phthisis. Wherever possible, water had been laid on with a view to keeping down the dust, and it is hoped by constant attention and the co-operation of the underground workmen that an all-round improvement will be effected. Mr. F. B. Lewis, the manager, in the course of his report, states that working costs were 14.68s. per ton and that the gross profits for the year were as follows: Working profit, as above, £210,750 7s. 8d.; sundry revenue, £20,643 17s. 10d.; total, £231,394 5s. 6d.

GLENCAIRN MAIN REEF: A HIGHER PROFIT.

Small Improvement in Grade—The Ore Reserves.

Mr. J. G. Lawn, the consulting engineer, in his annual report on the operations of this company, writes:—There was a slight improvement in the grade of the ore sent to the mill, and as the tonnage crushed was also increased by 8,932 tons, the gross profit for the year was higher by £6,167. The total profit amounted to £35,203. Of this amount, £9,645 represented profit from treatment of accumulated slime. Development work, so far as driving on reef was concerned, was confined to the Knights Tribute Section, where a fair amount of ore has been exposed. The reef is not of high value, but there is no doubt that it will repay the cost of working. A re-valuation of the ore reserves was made at the end of the year. As indicated in previous reports, there is a large body of reef of doubtful value in the mine. This ore is situated mostly in the hanging and footwall of reefs already stoped, and the value in many cases cannot be ascertained until the reef is actually mined. The definitely payable reserves in the mine amount to 205,418 milling tons, and in addition to this it is estimated that there are 1,111,164 tons of reef of doubtful value. Assuming 50 per cent. of this tonnage to be payable, the ore reserves would amount to 761,000 milling tons, and the estimated recovery value may be placed at 3.6 dwts. Mr. T. C. Bruce, the manager, reports that the grade of the ore was only 15.422s. per ton milled. Notwithstanding this, a working profit of £23,354 was earned, whilst the gross profit amounted to £35.203.

NEW RIETFONTEIN ESTATE CO.'S RESULTS.

Points from the Consulting Engineer's Annual Report—The Reef South of the Dyke.

The results of the year's operations at this mine are practically identical with those for 1911. The grade was a trifle lower, working costs were fractionally higher, and the quantity of ore milled was increased by 8,465 tons. The total gross profit amounted to £44,872, which was only some £14 less than the profit for the previous year. Mr. J. G. Lawn writes: The most interesting feature in connection with development was the work carried out in the section of the mine served by No. 1 shaft. This shaft was sunk 221 feet, and at the end of the year had attained an inclined depth of 1,599 feet. The 13th and 14th level stations were cut, and the reef intersected by cross-cuts at the 12th and 13th levels. For some distance, payable values were encountered, but latterly the grade of the reef fell away, and so far as this section has been opened up, comparatively little payable tonnage has been exposed. The ground in this portion of the mine is considerably disturbed by faulting, and the reef is lost some distance to the west of the shaft. It is intended, however, to push on with the sinking of the shaft, with a view to proving the ground further to the dip. A fair proportion of the tonnage mined was drawn from the old "Rietfontein A" section, and about a third of the total tonnage was obtained from reclamation and open workings. It was found necessary to make a close investigation into the position of the ore reserve at the end of the year. This was essential in view of the fact that several blocks of ground which had been included in the payable reserves at the end of 1911 proved, on being opened up, to contain reef below the pay limit. The re-estimation has shown that the payable reserves amounted to 135,887 millings tons, of an estimated recovery value of 6.5 dwts. In addition to this, there are developed in the mine 260,214 milling tons of uncertain value. Assuming that 50 per cent. of this rock will prove to be payable, then the total payable reserves would amount to 265,994 tons. The borehole to the south of the big dyke, to which reference was made in my last annual report, passed out of the Witwatersrand quartzites at 3,068 feet. Below this point, the formation consisted of igneous rock and talc chlorite schists, and the hole was therefore stopped at 3,553 feet. No further attempts have been made to ascertain the position of the reef south of the dyke. Mr. Chas. Marx, junior, reports that working costs were at the rate of 21.581s. per ton, whilst working profit was 4.098s. per ton.

THE MARCH OUTPUT IN DETAIL.

Rand Increase, £246,071—Small Decline in Outside Districts Production.

Total Output	790,552 ozs.
Value	£3,358,050
Increase	56,430 ozs.
Value	£239,698
Rand output	760,324 ozs.
Value	£3,229,652
Increase	57,930 ozs.
Value	£246,071
Outside districts	30,228 ozs.
Value	£128,398
Decrease	1,500 ozs.
Value	£6,373
Total stamps	9,987
Increase	59
Rand	9,475
Increase	100
Outside districts	312
Decrease	41

The First Dozen Companies.

The following are the details of production of the twelve leading companies:

	Stamps.	Tube Mills.	Tons Crushed.	Value.
Crown Mines	660	25	201,000	£299,520
Randfontein Central	850	29	234,407	282,160
East Rand Proprietary ...	820	25	162,500	255,811
Ferreira Deep	250	6	55,140	122,275
Robinson	250	6	59,600	110,033
New Modderfontein	180	7	52,000	102,192
Rose Deep	300	7	69,810	94,911
City Deep	150	9	45,400	87,393
Geldenhuis Deep	300	7	57,800	87,372
Robinson Deep	160	10	61,000	86,170
Nourse Mines	260	7	53,300	84,475
Knights Deep	400	9	110,100	82,274
Totals	4580	147	1,160,257	£1,694,586

Group Profits.

The following are the profits returned for January, February and March by the mines controlled by different groups:

	January.	February.	March.
Rand Mines (Eckstein) ...	£230,347	£233,575	£255,230
Rand Mines (Subsidiaries)	276,281	241,809	280,177
Robinson group	102,156	84,609	127,207
Gold Fields group	107,419	98,347	110,756
East Rand Proprietary ...	95,693	89,514	95,010
Barnato group	79,198	74,114	81,152
General Mining group ...	66,262	63,107	63,830
Neumann group	53,085	46,112	51,917
Cons. Mines Selection ...	39,115	37,407	30,116
Kleinfontein group	23,496	23,891	25,002
Goerz group	15,417	10,317	8,554
Totals	£1,088,460	£1,002,802	£1,128,951

Increases and Decreases.

The following returns of the March output have been filed with the Chamber of Mines. Increases and decreases compared with February are subjoined:—

The Witwatersrand.

	Feb. £	M . £	Inc. £	Dec £
Aurora West	18,325	18,796	471	—
Bantjes	38,145	40,413	2,268	—
Brakpan Mines	85,439	81,153	—	4,826
City and Suburban	48,088	52,375	4,287	—
City Deep	79,581	87,393	7,812	—
Cinderella Consolidated ...	22,874	23,872	998	—
Consolidated Langlaagte ...	55,263	59,362	4,099	—
Consolidated Main Reef ...	31,964	33,723	1,759	—
Crown Mines	268,393	299,520	31,127	—
Durban Roodepoort	14,353	15,186	833	—
Durban Roodepoort Deep ...	36,390	38,374	1,984	—
East Rand Proprietary ...	241,726	255,811	14,085	—
Ferreira Deep	104,078	122,275	18,197	—
Geldenhuis Deep	77,925	87,372	9,447	—
Geduld	17,849	17,509	—	340
Ginsberg	20,457	20,869	412	—
Glencairn	15,037	16,885	1,848	—
Knight Central	26,540	26,663	123	—
Knights Deep	74,552	82,274	7,722	—
Jumpers-cum-Treasury ...	12,968	12,756	—	212
Jupiter	36,832	46,177	9,345	—
Langlaagte Estate	55,216	59,243	4,027	—
Luipaardsvlei	17,403	18,766	1,363	—
May Consolidated	14,769	15,350	561	—
Main Reef West	28,252	30,694	2,442	—
Meyer and Charlton	34,096	33,684	—	412
Modder B.	60,484	66,192	5,708	—
New Goch	27,270	28,277	1,007	—
New Heriot	19,684	20,398	714	—
New Kleinfontein	67,755	73,205	5,450	—
New Modder	99,308	102,192	2,884	—
New Primrose	34,402	26,271	1,869	—
New Rietfontein	17,254	18,898	1,644	—
New Unified	15,525	16,800	1,275	—
Nourse Mines	79,785	84,475	4,690	—
Princess Estate	27,219	29,250	2,031	—
Randfontein Central	248,734	282,160	33,426	—
Rose Deep	90,150	94,911	4,761	—
Roodepoort United	20,134	24,140	4,006	—
Robinson	102,519	110,033	7,514	—
Robinson Deep	69,153	86,170	17,017	—
Simmer and Jack	73,350	79,297	5,939	—
Simmer Deep	51,279	55,233	3,954	—
Spes Bona	6,180	6,359	179	—
Van Ryn	51,967	50,009	—	1,958
Village Deep	69,705	73,443	3,738	—
Village Main Reef	66,766	71,269	4,503	—
Vogel Estate	15,640	16,333	693	—
West Rand Central	3,475	3,054	—	421
West Rand Consolidated ...	41,696	43,501	1,805	—
Witwatersrand	48,127	50,251	2,124	—
Wolhuter	33,825	36,365	2,540	—
Miscellaneous	15,642	15,516	—	126

Outside Districts.

	Feb. £	M . £	Inc. £	Dec £
Barrett	777	556	—	221
Glynn's Lydenburg	6,079	8,249	2,170	—
Nigel	18,694	20,143	1,449	—
Sheba	12,586	12,811	225	—
Sub Nigel	8,236	9,702	1,466	—
Transvaal G.M. Estates ...	41,101	42,602	1,502	—
Worcester	4,536	5,004	468	—
Miscellaneous producers ...	41,832	29,330	—	12,502

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Witwatersrand.				
Aurora West	14,222	80	4,425	£18,796
Bantjes Consolidated	29,850	100	9,514	40,413
Brakpan Mines	55,274	160	19,105	81,153
City Deep	45,400	150	20,574	87,393
City and Suburban	26,900	150	12,330	52,375
Cinderella Consolidated ...	18,310	85	5,620	23,872
Consolidated Langlaagte ...	41,900	100	13,975	59,362
Consolidated Main Reef ...	22,557	100	7,939	33,723
Crown Mines	201,000	660	70,513	299,520
Durban Rooodeport	14,101	90	3,575	15,186
Durban Roodepoort Deep ...	25,460	100	9,034	38,374
East Rand Proprietary ...	162,500	820	60,223	255,811
Ferreira Deep	55,140	250	28,786	122,275
Geldenhuis Deep	57,500	300	20,569	87,372
Ginsberg	15,095	80	4,913	20,869
Glencairn Main Reef	21,216	160	3,975	16,885
Geduld Proprietary Mines ...	14,300	50	4,122	17,509
Jupiter	44,250	110	10,871	46,177*
Jumpers-cum-Treasury ...	5,530	55	3,003	12,934*
Knights Deep	110,100	400	19,369	82,274
Knight Central	25,800	110	6,277	26,663
Langlaagte Estate	55,201	200	13,947	59,243
Luipaardsvlei Estate	16,670	60	4,418	18,766
Main Reef West	21,012	100	7,226	30 694
May Consolidated	15,620	100	3,609	15,330
Meyer and Charlton	14,506	75	7,930	33,684
Modderfontein B.	35,420	80	15,583	66,192
New Goch	28,260	120	6,657	28,277
New Heriot	11,200	70	4,802	20,398
New Kleinfontein	51,700	200	17,234	73,205
New Modderfontein	52,000	180	24,058	102,192
New Primrose	25,300	160	8,539	36,271
New Rietfontein	16,800	120	4,449	18,898
New Unified	12,480	60	3,955	16,800
Nourse Mines	53,300	260	19,887	84,475
Princess Estate	22,800	60	6,886	29,250
Robinson	59,600	250	25,904	110,033
Robinson Deep	61,000	160	20,286	86,170
Randfontein Central .	264,407	850	66,426	282,160
Roodepoort United	26,000	50	5,683	24,140
Rose Deep	69,810	300	22,344	94,911
Simmer Deep	63,750	160	13,003	55,233
Simmer and Jack	80,900	320	18,668	79,297
Spes Bona	6,377	40	1,497	6,359
Van Ryn	39,580	135	11,773	50,009*
Village Deep	51,200	180	17,290	73,443
Village Main Reef	38,740	220	16,778	71,269
Vogelstruis Estates	14,124	80	3,815	16,333
West Rand Central	1,732	20	719	3,054
West Rand Consolidated ...	29,250	100	10,241	43,501
Witwatersrand	38,800	220	11,830	50,251
Witwatersrand Deep ...	38,920	245	13,931	59,175
Wolhuter	28,200	120	8,561	36,365
Miscellaneous producers ...	—	—	3,653	15,516
Outside Districts.				
HEIDELBERG—				
Nigel	14,000	75	4,742	20,143
Sub Nigel	5,060	20	2,284	9,702*
BARBERTON—				
Barrett	—	—	131	556
Sheba	6,220	60	3,016	12,811
Worcester Exploration ...	6,000	40	1,178	5,004
LYDENBURG—				
Glynn's Lydenburg	3,689	20	1,942	8,249
Transvaal G.M. Estates ...	14,610	75	10,029	42,603
Miscellaneous producers ...	—	—	6,905	29,330

*Van Ryn does not include 1,265 ozs., value £5,373, taken from reserve and declared in output. *Jumpers-cum-Treasury does not include 42 ozs., value £178, taken from reserve and added to declared output. *Jupiter includes 850 ozs., value £3,610, taken from production and added to reserve. *Robinson Deep includes 1,000 ozs., value £4.248 taken from production and added to reserve. *Simmer Deep includes 750 ozs., value £3,186, taken from production and added to reserve. *Sub Nigel includes 100 ozs., value £425, taken from production and added to reserve.

NEW PRIMROSE; THE 1912 RESULTS.

Steady Reduction in Costs—The Development Aspect.

WE take the following from the Consulting Engineer's annual report as to the operations of this company last year: One of the features of the year at the New Primrose Mine has been the steady reduction in working costs. For 1911 the average cost per ton of ore milled was 14.852 shillings, and for 1912 this figure was reduced to 13.956 shillings per ton. The value of the reef sent to the mill was of slightly lower grade, but the quantity crushed was increased by over 7,000 tons, and the total gross profit amounted to £220,819, being an increase of £3,161 on the amount realised for 1911. The profit from treatment of accumulated slime, which amounted to £13,722, is included in the above amount. The treatment of these accumulations has been a source of considerable profit to the Company. There are still some 20,000 tons left, which, however, can only be treated at the rate of about 1,000 tons per month, as a tube mill plant has been installed, which will result in a larger percentage of slime being produced in the regular treatment of the ore from the mine. By means of the new plant it is hoped considerably to reduce the value of the residues and at the same time increase, to a small extent, the tonnage milled. This will enable lower grade ore to be treated at a profit, and will tend to prolong the life of the mine. Development operations were directed principally to the opening up of the southern series and of a section of Main Reef on the western side of the mine. Driving on the Main Reef has exposed ore of a satisfactory grade, and the southern series has also contributed a small quantity of payable reef to the reserves. Of the ore mined, quite a large percentage was obtained from reclamation, and the ascertained reserves were only drawn upon to a comparatively small extent. The southern series contributed 12.87 per cent. of the ore mined, as compared with 8.23 per cent. for 1911. A careful estimate of the ore reserves was made at the end of the year, and it was calculated that the payable tonnage amounted to 413,033 milling tons of an estimated recovery value of 6.5 dwts. During the year an appreciable improvement was effected in the underground conditions with a view to the prevention of miners' phthisis. Water has been laid on at every possible point in order to keep down the dust, and with the earnest support of the underground workmen it is hoped that the dust in the air will be reduced to a minimum. Mr. Van Eyssen, the manager, reports that the gross profit for the year was £220,819.

Miners' Phthisis Compensation.

In the Assembly this week, Mr. Creswell (Jeppe) asked the Minister of Mines what steps, if any, had been taken to recover the amount of £231 12s. 5d. due by three companies to the Miners' Phthisis Compensation Fund mentioned in paragraph 12 of the first report of the Miners' Phthisis Board, and whether those companies had now paid the amounts claimed by the Board. The reply was that pending the decision of the Supreme Court as to whether the three mines were legally entitled to be included, no steps had been taken by the Board to recover the amount due. It was understood that in the event of the Court's decision being favourable to the inclusion of the mines, interest would be paid on the amount outstanding.

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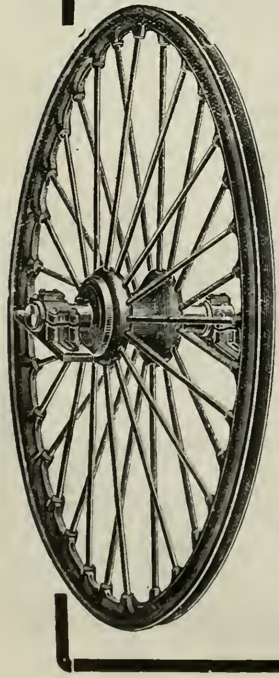

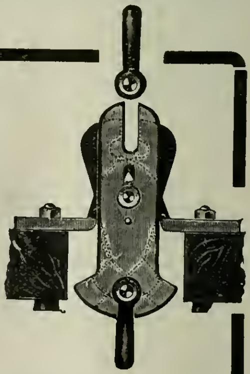

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Engineering Notes and News.

EQUIPMENT AT THE CROWN MINES.

The paper on "Centralised Organisation at the Crown Mines," which was read by Mr. R. C. Warriner, the general manager, before a recent meeting of the South African Association of Engineers, is the most complete that has ever been prepared to describe and illustrate the main features of the ore handling operations of a mine upon the Rand. The following extracts are of special interest:—

Sorting and Crushing Station.—At No. 5 shaft the ore is delivered from the skips on to the headgear grizzlies, which consist of two sets; the upper set is spaced 3¾in. and 8in. apart, and lies at an angle of 22 degrees. This upper set was put in, firstly to take the shock of the falling rock off from the fines grizzley, and secondly to retard the flow and so obtain better grading. The second set or fines grizzley is spaced 2in. apart, and lies at an angle of 45 degrees. The grizzlies are placed immediately above the fines bin and the fines accumulated in this bin are loaded direct into the 50-ton hopper trucks for transport to the mills. The oversize from both sets of grizzleys is delivered into a coarse rock bin, from whence it is fed to the sorting belts. The ore is washed as it is fed to the sorting belts in a chute fitted with sprays, and having a bottom fitted with grizzlies of fire bar section to remove the coarse particles, slime and water. The washing water for these sprays is delivered from a 5in. Enke high lift centrifugal pump, which is supplied from the mine pump column. The washing water is run by launder to a revolving separating screen which removes all particles over ¼in. in size; it then runs to an 8in. Robeson-Davidson sand pump, which delivers it to a conical separator at "C" mill, the overflow going direct to the slimes collecting tanks and the underflow to tailings pumps, and so to tube mills. The oversize from the separating screen is delivered into a small concrete bin from which it is raised periodically by means of a small air winch and skip, and tipped into the fines bin at the headgear. By this method clean water is used for washing, the labour usually employed for cleaning settling sumps is saved, and other difficulties common to this portion of a sorting station are overcome. The sorting belts, four in number, are 36in. wide, have an inclination of 14 degrees and are run at a speed of 150 feet per minute. Each belt is driven by a 25 h.p. motor, running at 500 r.p.m. through a 60 to 1 reduction gear fixed between the head pulley of the sorting belt and the pulley driven from the motor. To this pulley is attached a "Benn" friction clutch running in oil, and by this means the belts are stopped and started at will. This system is to provide for the thorough sorting of each portion of the belt. For example, a belt full of rock from the bin is run out and stopped. It is then the duty of each boy to pick the belt clean of waste immediately in front of him. As soon as the overseer in charge is satisfied that all the waste has been removed, he places a chalk mark at the bottom end of the belt, which is then set in motion and stopped again when the above-mentioned chalk mark is opposite the foremost sorting boy. The waste sorted is placed on the under side of the belt and is delivered into a waste rock bin of large capacity. One boy is employed on each waste rock belt sorting out any reef which may have been accidentally discarded. The waste is loaded from the bin into 20 cubic feet side-tipping trucks, and these trucks are elevated to the level of the top of the waste dump by a creeper chain gear, the capacity of which is 6 tons per minute. This chain ascends an incline of 20 degrees at a speed of 60 feet per minute. The system has proved most satisfactory, a considerable saving of labour being effected when compared with other types of elevators, and I believe this is the first plant at which it has been installed on there fields. At the head of the creeper chain gear, the trucks are attached to a mechanical haulage which conveys them to the dumping point. During sorting operations, the tube mill pebbles are also picked and deposited on a conveyor belt and running diagonally across and under the sorting floor in such a manner that the pebbles can be picked from either of the four sorting belts. The pebble conveyor delivers into a partitioned-off portion of the main bin under the crushers, from which the pebbles are loaded into the 50-ton hopper trucks for transport to the tube mill pebble bins at the various mills. The sorted ore is delivered at the upper end of the sorting belts into a distribution box or bin, which feeds three 30in. by 12 in. Hadfield and Jack reciprocating jaw crushers, for reduction to 1¼in. diameter. The crushed ore falls directly into the main ore bin and is loaded from there by pneumatically operated doors into the 50-ton hopper trucks. There whole of the plant is electrically driven by separate motors for each piece of machinery, the crusher motors being 60 h.p. each. The crusher station and bins are built of ferro-concrete and the sorting station of steel. The plant was laid out for a crushing capacity of 6,000 tons in ten hours, but for individual hours the output has been as high as 750 tons. The following table showing units of power consumed and cost of same for crushing and sorting should prove of interest:—

Month.	Tons Hoisted	Crushing.			Sorting.		
		Total Units consumed	Units per ton.	Cost per ton in pence.	Total Units consumed.	Units per ton.	Cost per ton in pence.
September ..	88,044*	—	—	—	—	—	—
October ...	105,836	26,195	·25	·13	13,500	·13	·07
November ...	101,896	35,431	·35	·18	17,500	·17	·09
December ...	109,430	29,444	·27	·14	23,500	·22	·12
January ...	135,940	27,675	·20	·11	29,500	·22	·12

* No reliable figures; available.

New Patents.

31. Margaret Emily Shearer.—Improvements in acetylene lamps.
32. James Oliver Bartle.—Improvements in lamps for lighting fuses and the like.
33. William George.—Improvements in studs.
34. (1) Hans Nordrok (2) Gentil Prelle.—Improvements in ball-bearings and the like.
35. Charles Ernest Legge.—Improvements in auxiliary tyre attachments.
36. Sydney John Buckley.—Side door truck fastening and automatic opening device.
37. Albert John Fortescue.—Improvements in variable gearing for windmills.
38. Ernest Schultz.—Improvements in shock absorbing spring suspension means for motor-cars and other vehicles.

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STOCKS IN JOHANNESBURG AND DURBAN.

DESIGN AND MAINTENANCE OF ROCK DRILL BITS.*

[By Ward Blackburn.]

The efficiency of a rock-drilling plant is determined by the amount of power delivered to the bit and converted into cutting power. No matter how efficient the compressing plant and the rock drills, or how careful the drill operator, if the bit is dull or of incorrect shape, the rock is not cut, good energy is wasted, and money and time are lost in reaming the borehole or in pulverising the rock, and the real object of the work is defeated. At most mines little attention is paid to the drill bits by anyone except the blacksmith. The drill runner is satisfied if the bits run out a change and hold gauge well for the next bit to follow. The fewer changes the better he likes it. The same is true of the blacksmith. The longer a bit is in service the less frequently must it be sharpened. The bit is designed for use as long as possible without resharpening and the cutting properties take second place.

Cutting More Important than Staying Qualities.—In designing a good bit both cutting and staying properties should be considered, but the day of hand-sharpening and of chuck bolts is rapidly passing, and now the efficiency sacrificed by staying properties is determined largely by the cost of transportation and handling of bits and permissible loss of gauge. It is not influenced to the same extent as formerly by the labour of sharpening or trouble of changing bits. The cost of transportation and handling of bits amounts to a considerable item, which increases as the lasting qualities of the bit are replaced by cutting qualities, so that it often governs the extent to which the design may be changed. Light, compact mechanical sharpeners can now be obtained at a reasonable price, and as these machines reduce the cost of sharpening to a low figure and enable the blacksmith to make several hundred bits per day, shop considerations offer no serious reason for retaining merely staying qualities in the design of the bit. Nearly all rock drills can be provided with a wedge chuck, or some means of holding the bit behind chuck keys so that bits can be changed in a fraction of a minute. This largely overcomes the objection to short bits. In several mines the cost of transportation and handling of bits is greatly reduced by installing the power sharpener with oil or coke furnaces underground. Allowable loss of gauge is an important factor, for the greater the loss the larger must be the diameter of the shorter bits to ensure a certain diameter of hole at a fixed depth. This larger diameter means a loss of power, so this point can never be lost sight of in determining the bit to be used. Operators who believe the gauge should be retained irrespective of the amount of power used run the edges of the wings of the bits about one inch in a line parallel to the axis, making the bit a reaming tool. If this is done, as soon as the cutting edges wear a little the shoulders begin to bind and stick against the sides of the hole, and it must be reamed out to a size which will allow the bit to move forward. When such a bit is removed from the hole it will show greater wear on the edges of the wings than on the cutting edges. As the bit is apparently as hard as $\frac{1}{2}$in. back, as on the cutting edge it is reasonable to suppose that there has been as much work done in wearing the steel of the wings as in wearing an equal amount at the cutting edge, that is if the reaming edges show more wear than the cutting edges, it is to be supposed that they have done at least as much work as the latter. In other words, as much if not more power has been expended in reaming the hole as in cutting it; half the power has been used in cutting an area of, say, seven sq. in., that of a 3-in. circle, and half the power has been used in reaming an area of a little more than $\frac{1}{2}$ sq. in., the area of the 1-16in. rings reamed out. Furthermore, the rock drill is designed to cut rock by means of a blow. It is not a reaming machine, and as soon as a bit is cutting or reaming the side of the hole it is retarding the action of the drill. This strains the rotation and has a tendency to twist and break the bit. Power expended in reaming is power lost. From this it is apparent that because of the rapid loss of power and wear and tear on the rock drill, little of the efficiency of the bit should be sacrificed to the reaming qualities. It is sometimes claimed that unless the bit has reaming edges the hole will become rifled. This was true to some extent when the bits were forged by hand, but it was due to the difficulty of getting each corner or wing equi-distant from the centre of the bit. With most power sharpeners this difficulty is removed, and with the correctly formed bits there is little trouble from rifling.

What Constitutes a Good Bit.—While it is true that one bit cannot be selected as a standard for any and all classes of rock, still the power-sharpener manufacturers, especially those who have gone into the study of drill bits, are gradually working towards a few standard types. The concensus of opinion is that under average conditions a good bit for power-drilling work should embody the following points: (1) It must take full advantage of the chipping and fracturing of the rock. In a borehole there is a certain depth to which the rock will fracture when struck by a sharp tool. If the tool is driven deeper than this it will not fracture the rock, it will crush it. If the cutting edge of the bit is blunt it will not get full advantage of the fracture, and considerable of the force will be expended in crushing or pulverising. The bit acts as a wedge. (2) The wings of the bits should be as thin as is consistent with standing-up quality to allow for the ejection of the cuttings. If the wings are left heavy there is little space for the escape of the cuttings, and consequently they are held in front of the bit and continually churned and ground, the bit does not easily reach solid rock, and the blow loses a large proportion of its cutting power before it reaches the rock. (3) The bit must be perfectly free in the hole at all times; because of the tendency of the rock to fracture, the drill hole will be a trifle larger than the cutting edge. If the bit is so designed that the cutting edge is its greatest diameter and will practically remain so until it will always remain free in the hole. (4) The bit must allow equal wear on all corners. If the bit is not symmetrical, that is if the ends of all cutting edges are not the same distance from the centre of the bit, the longest end will cut a groove in the side of the borehole and a rifled hole will result. Furthermore, the wear is unequal and the extra strains in the steel often break it. The rotation of the drill is impeded and the parts subjected to excessive wear. (5) The bit must be dressed in a manner consistent with the treatment of good steel. It must not be overheated or worked while too hot. Light rapid blows should be used in forging. The bit must be tempered properly. The proper temper should be determined by experiment and rigidly adhered to. The bit should be allowed to cool thoroughly after forging and should then be reheated for tempering. It should never be sharpened and tempered on the same heat.

Bits Should Fracture the Rock.—In Fig. 1 are shown bits designed to fill these requirements. An angle of about 90 degrees for the cutting edge is generally accepted as the correct angle. If the angle is greater the bit has a tendency to crush rather than fracture the rock, and as a rule the bit cuts slowly. An angle less than 90 degrees gives a bit which will cut fast, but it has a tendency to break off and wear rapidly. There is also a tendency for it to enter the rock, especially soft rock, past the point of fracture and expend energy in crushing or wedging out the rock. The "mudding" powers are greatly diminished. The thickness of the wings may range from $\frac{3}{4}$in. on a large steel to $\frac{3}{8}$in. or even less on a stoper and rammer-drill bit. The wing must not be so thin that it breaks off, still, the less stock necessary the better the clearance for the cuttings. The third point is probably the hardest to comply with. When the bits shown in Fig. 1 are first placed in the hole the cutting edge is the largest diameter, and as it may be safely assumed that the rock will fracture 1-16in.

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* From "The Compressed Air Magazine."

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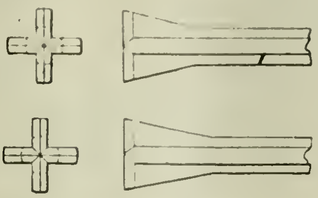
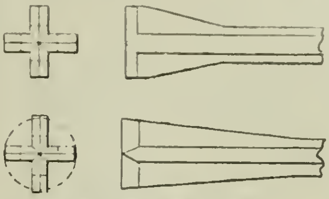
beyond the bit, the latter must be free in the hole. The wings of the bit taper in the ratio of one to four, or one to five, and as the cutting edge wears a shoulder or reaming edge forms on the wing. When it wears between 1·16 and ⅛in. from each wing a shoulder ¼ to ⅜in. forms, and there is a point between these where the cutting edge is fracturing the rock in the side of the hole to a diameter equal to the diameter of the bit through the shoulders. In other words, the shoulders of the bit are just touching the sides of the hole. If the bits run past this point, the cutting edge will not cut the hole to a diameter large enough to admit the bit and the shoulders immediately becoming reaming surfaces. The taper of 1 :4 or 1 :5 is determined upon a medium. If less taper is used, say 1 :7, the shoulders become more prominent and the cutting edge has less allowable wearing surface before the bit binds the hole causing the shoulders to become reaming surfaces. If the wings have a greater taper, say 1 :2, the wear is excessive, and the loss of gauge prohibitive. The sharp taper leaves the ends of the cutting edge in a weakened condition and they easily break the chip off.



Correctly Made Bits.
FIG. 1.



Incorrectly Made Bits.
FIG. 2.

Machine Sharpeners Make Uniform Bits.—The necessity for having the drill bit concentric is obvious. In hand sharpening and even with some power sharpeners it is not uncommon to find one of the ends of the cutting edges protruding 1-32 to 1-16in. beyond the others. Some sharpener manufacturers have effectively overcome this difficulty by entirely enclosing the bit under a heavy pressure while it is being forged. When this is done there can be no question as to the corners falling within a circle. The tempering and manner of heating and treating the bit is generally left to the discretion of the blacksmith. This is a mistake, as a little attention and study given the subject by the manager or superintendent will often result in marked improvements. Many kinds of steel now on the market, and the scientific methods of treatment are entirely new to the average smith. A word should be said about mechanical sharpeners. These machines have been greatly improved in the last few years, and now extremely light, simple designs of remarkably high capacity and efficiency are within the reach of all. The bits dressed in the sharpener are always perfect in form and gauge, and everything considered will give from 25 to 50 per cent. greater efficiency than if sharpened by hand. In addition to the increased speed of drilling there is a noticeable saving in the wear and breakage of machine parts and the bit itself lasts longer and wears much better. When installing a power sharpener one should not lose sight of its main advantage, increasing the efficiency of the drill bit. It should be installed with the idea that because of the marked reduction in the cost and time of sharpening one can afford to furnish the drill with better steel more often. It is impossible to make a hard and fast rule as to when a power machine should be installed, but it is certain that a sharpener will effect a material reduction in cost per steel dressed, lessen the machine repair parts required, save steel and steel breakage, and greatly increase the drilling speed of machines.

[The above article is of especial local importance at the present in view of the very successful results obtained through the use of Leyner drill-sharpening machines at the Modder B, Brakpan, and Crown Mines. The satisfactory treatment of "star" or machine bits by these drill-sharpeners is worthy of particular remark.—Ed., *S.A.M.J.*]

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Finance, Commerce, and Industries.

Delagoa Bay Coal Loading Plant.

A cable has been sent to the Portuguese Colonial Minister asking for permission to place the order for the supply and erection of the Delagoa Bay coal loading plant with McMylers of Cleveland, Ohio. To this the Colonial Minister has agreed. It is expected that not later than January, 1914, the coal loading plant will be at work—a plant, we are informed, that will be the best and most up-to-date in South Africa.

* * * *

Railway Board's Report.

The report of the Board of the South African Railways and Harbours for the year ending the 31st of December, 1912, states that the mileage open and working at that date was 8,401¼ miles, compared with 8,199¾ in 1911, an increase of 301½ miles. The average of open miles was 8,632 in 1912 and 7,284 in 1911. The train mileage was 28,173,706 and 25,521,713. Referring to the question of interest on capital, the report says that it is desired to place on record the recommendation made last year by the Select Committee on Public Accounts, which has been acted on, and results in a total surrender of railway revenue amounting to £445,496 annually in perpetuity. Should Parliament, contrary to the Board's contention, decide to act on the report of the Select Committee, the Board suggests that the contribution should be devoted towards the establishment of a sinking fund, to be utilised for the redemption of Railway and Harbours Loans, so that such loans would become redeemed, the payment of interest thereon would then cease, Railway revenue to that extent would be set free, and the Board thereby would be afforded greater scope for dealing with reductions in railway rates. Under revenue and expenditure, the total earnings were £12,247,027 and £12,104,769 for 1912 and 1911 respectively, and the net surpluses £1,866,094 and £2,636,329. The number of passengers carried in 1912 was 41,650,491, in 1911 37,165,697; and the revenue from passengers was £3,309,347 and £3,078,300.

* * * *

New York Life.

The 68th annual report of the above-named company reveals wonderful vitality and activity, combined with economy in management. The volume of new business written and paid for during the year 1912 reaches the huge total of £40,764,697 (being the legal limits permitted), while the sum spent by the company for all purposes in the way of expenses, etc., was 36 per cent. less than the amount prescribed under the rigorous exactions of the new Insurance Laws of the State of New York. Notwithstanding the large total of new business written last year, the ratio of expenses (including taxes) to total income figures at 11·1 per cent. The magnitude of the company's operations the world over is revealed by the figures for 1912, which, for comparison's sake, in round numbers, we place alongside of those for the previous year:—

	1911.	1912.
Assets	£140,000,000	£147,000,000
New business	36,000,000	40,000,000
Total income	23,000,000	24,000,000
Premiums received	16,000,000	17,000,000
Death claims paid	5,000,000	5,000,000
Other payments to policyholders	5,000,000	5,000,000
Dividends declared	2,000,000	2,000,000

The report states that "the increase in the earning power of the company's assets during the last seven years is equal to 0·29 per cent. Translated into pounds, this means an increase in earning power this year over 1905 of more than £410,000." Mr. Darwin P. Kingsley concludes his report with the significant words: "Nineteen twelve was a good year."

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DIVIDEND No. 11.

NOTICE IS HEREBY GIVEN that a Dividend of Six and one-quarter (6¼) per cent. for the six months ending 30th April, 1913, equal to 1s. 3d. per £1 share has been declared payable to Shareholders registered on the 30th April, 1913. Dividend Warrants will be paid out as soon as practicable after the receipt of London Transfer Returns to that date. Holders of Share Warrants to Bearer are informed that they will receive payment of the dividend on presentation of Coupon No. 11 at the London Office of the Company, Salisbury House, London Wall, E.C.

The Transfer Registers of the Company will be closed from the 1st to the 8th May, 1913, both days inclusive.

By Order of the Board,
H. G. L. PANCHAUD, Secretary.

Head Office, Johannesburg,
16th April, 1913.

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THE WEEK IN THE SHAREMARKET.

Much Improved Tone—Some Fluctuations at a Higher Level.

With the better news from the Balkans and the reduction in the Bank rate, the market has taken a decidedly better turn this week. There has been a general firming up in the quotations for all Rand stocks and undoubtedly a continuance of the existing good conditions will ensure a further improvement. The usual setbacks and fluctuations must, of course, be expected, but the whole tendency seems in the direction of a better and more active market. Tin and diamond shares are stronger in sympathy with the general tone, and increasing business is being done in connection with tho smaller syndicates. The provision of working capital by Messrs. Lewis & Marks to three or four concerns has increased confidence in diamond shares generally, and, though there are strong rumours that the Government is in sympathy with some further export tax on diamonds or or bounty to encourage a diamond-cutting industry, nothing definite is yet known.

	*	*	*	*		
	Friday, 11th.	Sat., 12th.	Mon., 14th.	Tues., 15th.	Wed., 16th.	Thur., 17th.
African Farms ..	16 6B	16 9B	17 3	17 3B	17 0B	17 0
Apex Mines ..	26 3B	26 9	27 0B	28 6	28 6	27 6B
Aurora West Uniteds	—	—	10 0B	10 0	—	—
Bantjes Consolidated	23 9s	22 6B	23 0B	23 6B	23 9B	23 1
Benoni Consolidated	3 0s	2 6B	3 2	3 3B	3 6	3 3B
Blaauwbosch Diam.	—	—	—	—	—	110 0s
Brakpan Mines ..	89 0	90 0	90 0B	90 9B	90 0B	88 0B
Breyten Collieries ..	—	—	—	30 0B	31 0B	—
British S.A.	—	22 6B	23 0B	24 6B	24 0B	—
Bushveld Tins ..	0 11B	0 11B	0 11B	1 1s	0 11B	0 11B
Cinderella Cons. ..	—	—	—	—	17 6B	—
City & Subs. (£4) ..	48 0B	49 9	49 6B	50 6	50 6s	49 0B
City Deeps	67 3B	68 6	69 9	71 6	70 0B	69 6
Cloverfield Mines ..	6 0	6 1B	6 4	6 9	6 10	6 6
Clydesdale Colls. ..	8 6B	—	8 6B	8 6B	8 6B	—
Concrete Constr. ..	4 0B	5 0s	5 0s	—	—	—
Cons. Investment ..	—	—	—	—	22 0B	21 6B
Cons. Langlaagtes	28 0B	28 0B	28 3	28 9	28 6	28 3
Cons. Main Reefs ..	19 3B	16 9B	20 6	21 3B	21 0	20 0B
Cons. Mine Select ..	14 0s	13 0B	13 6B	—	14 0B	15 0s
Coronation Freeholds	0 5B	0 5B	0 6B	0 6B	0 6B	—
Coronation Synd...	—	3 0B	3 0B	—	—	3 6B
Crown Diamonds ..	5 6B	6 0B	6 0B	—	[illegible] 3B	8 6
Crown Mines ..	—	142 6B	—	—	148 6B	49 0B
East Rand Central	9 6B	9 9B	9 9B	10 0B	10 3B	9 9B
East Rand Coals (2/6)	1 10	1 9B	1 10B	1 10B	1 10B	1 9B
East Rand Deeps ..	2 10	2 10	2 10B	2 10	2 9B	—
East Rand M. Est.	—	7 9B	8 0B	—	—	—
East Rand Props.	58 0s	55 0B	57 0B	57 6B	57 6B	—
East Rand Debs. ..	£93B	£93B	£93B	£93B	£93½B	£93½B
Eastern Golds (1/-)	1 9B	2 0s	1 10B	1 10B	—	1 10B
Ferreira Deeps ..	—	—	—	—	67 6B	—
Frank Smith Diam.	11 9	11 6B	11 9B	12 0	12 0	12 0s
Geduld Props. ..	21 6B	22 3B	23 0B	24 0	24 0	23 6B
Geldenhuis Deeps	—	31 0B	31 6B	32 6B	32 6B	32 6B
General Minings ..	17 8	6B 18	0B 0B	18 3B	18 0B	—
Glencairns	2 9B	3 0B	—	—	—	—
Glencoe (Natal) Colls.	7 6B	7 0B	7 3B	7 3B	7 6B	7 6B
Glynn's Lydenburgs	20 0B	20 0B	21 0B	21 0B	21 6B	22 0
Government Areas	21 0B	21 3B	21 9	23 0	22 6	22 3B
Hex River Expls. ..	1 0B	1 0B	1 0B	1 1B	1 0B	—
Jumpers	4 0B	4 0B	—	—	4 0B	5 0
Jupiters	10 6	10 6B	10 6B	11 6	10 6B	10 6B
Kaalfontein D. (2/6)	0 4B	—	0 4B	0 5B	0 4B	0 4B
Kleinfontein Est. ..	—	—	18 6B	—	—	—
Klerksdorp Props...	2 10	2 9B	2 10B	2 11	2 10B	2 10B
Knight Central ..	13 0	13 4	13 5	13 9	13 6	13 3B
Knights Deeps ..	—	—	42 0B	—	—	42 6B
Lace Props.	3 8B	3 9	3 9B	3 9B	3 10B	3 9B
Luipaardsvlei Est.	8 6B	—	8 9B	8 9B	8 9B	8 9B
Lydenburg Gold Fms.	2 7B	—	2 7B	2 7B	2 7B	2 8
Main Reef Wests ..	—	17 9	17 9	18 0B	17 9B	16 3B
Meyer & Charlton	107 6B	107 6B	107 6B	107 6B	109 0B	—
Middlevlei Estates	1 3B	—	1 2B	1 2B	—	—
Modder B's	76 6B	77 6	79 0B	79 6B	79 6B	80 0s
Modder Deeps ..	37 0B	37 6	37 6	38 3	38 6	37 6B
Natal Navigation Col.	16 3B	—	16 6B	16 3	16 0B	16 0s
New Boksburgs ..	2 0s	2 0s	1 0B	2 0s	1 0B	—
New Eland Diam.	—	25 0B	25 0B	26 0B	—	25 0B
New Era Cons (5/-)	7 9B	8 3	8 4B	8 6B	8 6	8 0B
Hew Geduld Deeps	2 6s	2 4B	2 4B	2 5B	2 6	2 5B
New Kleinfonteins	21 6B	21 9	22 3B	22 0B	22 0B	22 0B

B Buyers. s Sellers.

	Friday, 11th.	Sat., 12th.	Mon., 14th.	Tues., 15th.	Wed., 16th.	Thur., 17th.
New Modders ..	247 0B	250 0B	250 0B	255 0B	258 9B	260 0B
New Rietfonteins ..	6 0B	6 0B	6 0B	6 6B	6 0B	—
New Unifieds ..	14 0B	14 0B	14 0B	14 0B	14 6B	16 9s
Nigels	17 6s	—	—	—	—	—
O.F.S. & Trans. Dis.	1 9	1 10	1 10B	1 10	1 10	1 9B
Paardekraal Ests. ..	—	—	—	—	1 0s	—
Pickstone Golds ..	35 0B	37 6B	38 6B	38 0B	—	40 0B
Potchefstroom Est.	0 9	—	—	0 9B	1 0B	—
Premier Pref. (5/-)	172 6B	177 6B	177 6B	177 6B	182 6B	—
Pretoria Cement Co.	51 6B	—	53 0B	53 0B	53 0	53 0B
Rand Collieries ..	—	—	6 0B	6 3B	6 3B	—
Rand Klips	1 7B	1 6B	1 9B	1 9B	1 9B	1 9B
Rand Nucleus ..	2 8B	2 9B	2 9B	3 0	3 0	2 9B
Randfontein Deeps	5 0B	5 3B	5 6	5 6B	5 6B	6 0s
Randfontein Ests.	28 6B	29 6	29 6B	30 3	30 6B	29 6B
Roberts Victors ..	32 6B	—	—	—	—	—
Robinson Deeps ..	—	39 0B	39 0B	39 0B	39 0B	—
Rooiberg Minerals	36 6	36 0	36 3B	37 6	36 6	35 6
Rood. Durban ..	17 6B	—	—	—	—	17 6B
Rood. Durban Deep	22 6B	23 0B	23 0B	23 9	—	23 9B
Rose Deeps	—	—	—	60 0B	—	—
Ryan Nigels	3 6B	3 6B	3 6B	3 6B	3 6B	3 6B
Shebas	5 0B	5 0B	5 0B	5 0B	5 0B	—
Simmer Deep ..	3 0B	—	3 0B	3 0B	3 0B	3 0B
Solomon's Temple Tin	0 9s	—	—	—	—	0 9s
S.A. Breweries ..	—	—	—	—	40 0B	—
S.A. Lands	4 1B	4 2B	4 2B	4 4	4 5	4 4B
Springs Mines ..	15 6B	16 9	16 9	17 6	17 6	16 9
Sub Nigels	13 0	12 9B	13 0	13 0	—	12 6B
Swaziland Tins ..	32 6B	33 9B	—	35 0B	35 0B	36 0B
Trans. & Delagoa ..	27 6B	—	—	—	—	—
Trans. Coal Trusts	49 6	50 6	50 0B	51 0B	52 0	51 0
Trans. Cons. Lands	—	—	27 3B	27 0B	27 6B	27 0B
Trans. G.M. Estates	53 6	53 0B	54 0B	54 0B	54 6B	—
Tudors	2 0s	—	2 0s	—	—	2 0s
Van Ryn Deeps ..	27 0	28 0B	28 9	28 9	28 6	28 3
Village Deeps ..	43 9B	44 6B	44 0B	45 0B	45 0B	45 0s
Vogel. Cons. Deeps	—	1 0B	1 3B	1 9	1 9B	2 0B
West Rand Estates	4 0B	4 0B	4 0B	—	4 0B	4 0B
Witbank Collieries	47 0B	—	46 0B	46 0B	46 0B	46 0B
Witwatersrands ..	63 6B	63 6B	—	64 6B	64 6B	—
Wit Deep	53 9	54 0B	55 0B	55 6	55 6B	55 3
Wit Townships ..	25 0B	—	25 0B	26 0B	26 0B	26 0B
Wolhuters	17 3B	17 3B	17 3B	17 9	17 9	17 6B
Zaaiplaats Tins ..	36 0	37 3	37 6	38 9	38 3	37 6B

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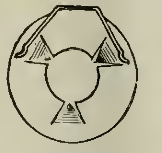
Automobile Notes.

The race sub-committee of the Rand Motor Cycling Club has decided that the race to Durban from Johannesburg for the Hutchinson Trophy will be held on the 10th, 11th and 12th of May. The original idea of limiting the time to two days has been abandoned. Days are short in May and night riding on most South African roads, and particularly on the road to Natal, is a practical impossibility. The value of the prize list will be in the neighbourhood of £150 to £200. The race is open to any motor cyclist, but the committee reserves the right to refuse any entry without giving a reason for its action. Solo machines only will be allowed to compete. Entries close on April 24th, and the handicap lists will be published on the 1st of May; no late entries will be accepted in any circumstances. All entries must be accompanied by the fee which has been fixed, £1 1s. The holding of the race is subject to an entry of not less than twenty competitors being received. Competitors will be handicapped solely on the cubic capacity of the engine of the machine entered. The same machine must be ridden throughout the race, and competitors will not be allowed to purchase, receive or procure any assistance during the run. Spare parts, tyres and tubes may be carried from the start where they will be marked and none others than those so carried may be used by a competitor.

* * * *

Petrol and oil will be supplied gratis at authorised stations along the route, and must not be obtained elsewhere. The race will start from the City Deep, Johannesburg, on Saturday, the 10th May, at 9 a.m. Competitors must be at the starting point at 8 a.m. to permit machines being sealed and stamped, competitors not present at the time stated will be disqualified. The limit man leaves at 9 a.m., the others at intervals in order of their handicaps. The first control will be at Standerton (104 miles), where the time of arrival of each competitor will be recorded, and the machine placed in control. The first to arrive will leave at 6 a.m. the following morning, the other competitors will leave in the same order and at the same interval as they arrived. The second control will be at Ladysmith (263 miles), where the same procedure will be adopted. No competitor will be allowed access to his machine while in control, all repairs, adjustments and replenishments with oil and petrol must be done in running time. The following are the authorised petrol and oil stations: Balfour, 53 miles; Standerton, 104 miles; Volksrust, 159 miles; Newcastle, 193 miles; Ladysmith, 263 miles; Estcourt, 303 miles; Maritzburg, 365 miles; Durban, 420 miles. The finish will be at Durban Town Hall; total distance, about 420 miles. The road throughout will be patrolled and watched by officials, who will see that the conditions are adhered to. All gates must be opened and closed by the competitors themselves. Competitors must ride with cutouts closed while passing through towns and villages. Exhaust pipes must be so fitted that the exhaust gases do not strike the ground direct. The machines will be examined at the finish to ascertain that seals are intact. The road will be arrowed, the route being that laid down in the " South African Motorist " road map, which can be obtained from the hon. secretary on application, price £1 1s. Competitors failing to carry out the con-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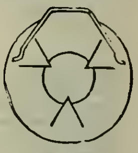
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ditions as laid down will be disqualified. The interpretation of these rules rests with the committee of the Rand Motor Cycling Club, who shall be the sole judges, and who may, should there be occasion, make any necessary alterations or amendments.

* * * *

Scratches may be removed from varnished carriage work in the following manner: Take powdered rottenstone and linseed oil; soak a soft rag in the oil, dip it in the rottenstone, and gently rub it over the scratch, in one direction only, until it disappears.

* * * *

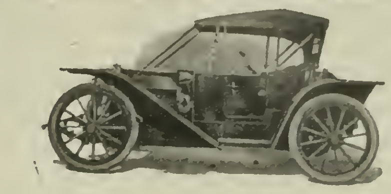
The Standard Oil Company has announced that it is introducing a new fuel for motor vehicles in America. It is described as an additional by-product of petroleum, and from a given quantity of crude oil almost as much of the new fuel can be obtained as gasolene. The new spirit is yellow in colour and has a pungent odour, and its specific gravity ranges from 52 to 55 degrees Baume, slightly heavier than gasolene. It requires a little more air for combustion than that spirit, but has the disadvantage of giving a white smoky exhaust. It is stated to give 25 per cent. more power, and one quarter more mileage than gasolene.

* * * *

The American Automobile Association has under consideration a suggestion from the railway locomotive engineers in Boston for the abolition of the red tail-lights on motor cars. In many parts the roads run alongside the railroads, and railway engineers are sometimes misled by taking the red light of a motor car for an engine. In several instances the trains have been pulled up with a jerk, resulting in damage to the train and injuries to the passengers.

* * * *

One of the most commendable of motorists' appliances introduced recently is a leaf spring opener, by the aid of which the springs of a car may be readily and thoroughly lubricated. This device consists simply of a short, steel rod



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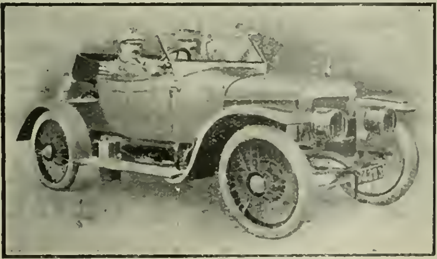

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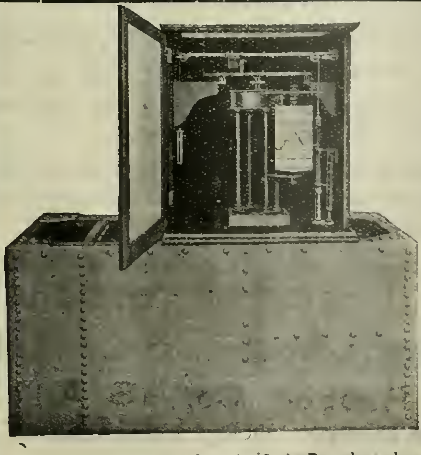

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having three brackets, similar to small crank webs, projecting from it in line, one at each end being fast, while the third has a sliding motion between the first two. The sliding bracket is driven towards an end one by a screw in the remaining bracket, and on each of these two faces which thus approach is fixed a small chisel-like projection. The action of the tool resembles that of a pair of chisels forced simultaneously between the plates of the spring from either side. Each plate separately so "opened" from its neighbour offers free access for grease and a spring may, therefore, be lubricated perfectly throughout with the greatest ease.

* * * *

Such lubrication is extremely desirable, for there is very considerable friction between the plates of springs. The question of wear does not, of course, come in for any serious consideration, excepting in the case of the shackle eyes and bolts, where, however, separate and independent means of lubrication should be provided. But "dry" springs mean hard suspension and annoying squeaks, and neither is good for the general well-being of a car. Effective lubrication is the secret of smooth running, durability and, in a great measure, of high efficiency in any piece of mechanism. This fact is too much neglected as a rule. It is not by any means sufficient to see that the engine is receiving a proper supply of oil, or that the gear-box and differential casing are filled with grease. There are dozens of other more or less minor working parts on a chassis to which attention must be devoted.

* * * *

The springs, as mentioned already, require ample lubrication. Then there are the steering joints, the brake connections, the pedal rods or weigh-shafts, the clutch-operating fork and rollers, the universal joints, the gear and brake levers, and all the small joints and guides incidental to the engine control arrangements. Another part apt to be overlooked is the starting handle, which should be kept oiled, notwithstanding that it is not always in motion.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

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Notes and News.

Lewis & Marks' New Diamond Trust.

The activity lately displayed by the diamond branch of Messrs Lewis & Marks has attracted much attention. This activity is evidenced in the provision of further working capital to several diamond propositions. In recent issues we announced that a hand in financing the New Thor and National properties had been taken by this well-known firm; and we now understand that the Montrose has been added to the list. Acting on good advice, the firm has decided to have a further and more thorough test on an adequate scale made of the possibilities of the last-named, and steps are being taken with that end in view. With the Crown Diamond mine and the Roberts Victor, which it directly controls, it will be seen that the House has now considerable and well distributed diamond interests, all with very fair prospects of success under present conditions. It is understood that the growth of these interests has led to negotiations with a view to their separate flotation as a parent company to deal solely with diamond ventures, and an official announcement in regard to this step may shortly be expected.

* * * *

Another Strike in the New Modderfontein.

A further important event in the history of the New Modderfontein Gold Mining Company has to be recorded. A cross-cut has been carried in to the north of the new circular shaft and at a distance of 252 feet the reef has been struck. Assays have given the highly satisfactory result of 9·5 dwts. over 50 ins. Such a result considered in conjunction with the good values obtained in the shaft itself, augurs well for the future of the south-eastern portion of the New Modderfontein property, a section of which is virtually unexploited and from which a vast tonnage of ore will be drawn in the near future. The latest strike tends to confirm the opinion now generally held in well-informed circles—namely, that the New Modderfontein is destined at an early date to rise to a markedly higher position in the list of the world's premier gold mines than it at present occupies.

* * * *

Prospectors at Prieska.

In our issue of a week or two ago we dealt at some length with the ferruginous beds of the Griqua Town series in the neighbourhood of Prieska and referred to statements made in the House of Assembly about the mineral possibilities of this district. Accordingly, it is of much interest to learn that a party of prospectors has arrived at Prieska from the Transvaal and that in consequence of the publicity recently given to the existence of mineral wealth in the Prieska district other parties are expected. The prospectors who have already arrived are, it is understood, making a thorough search for asbestos and iron ore, and it will be of much interest to note the success attending their efforts.

* * * *

San Francisco Mines.

It is to be gathered from the prospectus of the San Francisco Mines of Mexico, which has appeared during the week, that Messrs, A. Goerz & Co., Limited, are increasing their interests in Mexico, their name appearing as the underwriters of the whole of the £200,000 debenture issue offered with the view to liquidating the debts of the old company and providing a minimum of £100,000 working capital for the reconstructed concern.

* * * *

Goerz & Co.

The accounts of A. Goerz & Co., Ltd., for the year ended on December 31 last show a loss (before providing for writings off in respect of shareholdings) amounting to £821. After allowing for £38,568 14s. 5d. brought forward from 1911, a sum of £37,748 remains to be carried forward to the credit of the profit and loss account. The aggregate value of the company's holdings in shares and debentures of other companies, based upon market quotations or upon the directors' valuation where no market price exists, was £1,095,136, as compared with the price (i.e., cost or below cost) of £1,305,638, at which they stand in the company's books, showing a depreciation on balance of £210,502, as compared with £118,699 16s. 6d. on December 31, 1911. The reserve account remains at £160,000.

* * * *

Central Mining and Investment.

At the annual meeting of the Central Mining and Investment Corporation, Limited, which will be held about the end of April, the directors will propose a final dividend of 6s. per share, free of income tax, for the year ended December 31, 1912. This, with the dividend of 6s. per share, free of income tax, paid on August, 9, 1912, will bring the distribution for the year up to 5 per cent., free of income tax.

* * * *

Anglo-French Exploration.

The Anglo-French Exploration Company's directors announce that they propose to recommend, at the meeting to be held on the 30th inst., a distribution of 6 per cent. on the ordinary shares for 1912. For 1911 the holders of the ordinary shares received nothing, but for 1910 they got 7½ per cent.

* * * *

Unification of the Carat.

It appears likely that the unit of weight in regard to gems is likely to become a subject for the consideration of universal standardisation committees in the near future. The *Times* correspondent at Brussels writes:—"The *Moniteur Officiel* has published the law lately approved by the Chambers and permitting the use of the metric carat of 200 mg. in transactions relating to diamonds, real pearls, and precious materials. This is considered to be an important step towards the standardisation of the metric carat of 200 mg. throughout the world; it has already been legally introduced in Spain and Switzerland."

* * * *

Modder Deep Levels.

A rumour has been in circulation this week as to serious water troubles at the Modder Deep Levels mine. We are in a position authoritatively to deny the report. It is true that a certain amount of water has to be dealt with, but that any serious difficulties have had to be faced is quite incorrect. The mine is, we understand, developing satisfactorily and the day is not now far distant when the mine will take its place alongside the other great propositions of the Further East Rand and help to enhance the golden harvest of the Main Reef series.

* * * *

Rand Klip.

The Rand Klip people seem to have become discouraged. It appears that development footage during the quarter was 2,445 feet; total for three months, 6,177. There is a considerable improvement in value in the third level, and the face of the main winze is in payable ore. All development work was suspended at the end of March, and all plant, including pipes, rails and pumps, is being removed from the mine. Arrangements have been made to transfer a considerable proportion of the complement of native labourers to other companies. The net expenditure for the quarter on development, equipment and general charges amounted to £13,584 14s. 8d. The balance of cash in hand at March 31, 1913, after providing for the payment of sundry creditors, amounted to £12,369 11s. 11d.

* * * *

Position at Geduld.

To the east of the Modder Deep Levels property the Geduld Proprietary (also under Goerz control) is preparing to augment its outputs and profits. Construction work in connection with the new plant has reached an advanced stage and everything points to the entire new equipment being handed over by the contractors at the end of next month. Naturally, the preparation of the mine for the delivery of the larger tonnage shortly to be called for has affected operations. A considerable tonnage of ore going to the mill has been derived from the development dump, and the production and profit have been below normal. It is probable that the results for the current month and for May will similarly be not up to the standard of the mine. After the necessary absorption has taken place in the new plant there should, however, be a distinct improvement in the results announced.

* * * *

The New Union Issue.

Details are now available of the recent issue by the London County and Westminster Bank, Limited, of £4,000,000 Union of South Africa Consolidated four per cent. stock at the price of par, the instalments being spread over until June 16 next, while a full six months' interest is payable on September 1. The loan is repayable at par on March 1, 1963, the Government of the Union of South Africa having the option to redeem the stock at par on March 1, 1943, on giving three months' notice. The loan is raised for railways and harbours and their equipment, telegraphs and telephones, and other public works and public services. In addition to the provision of about £600,000 per annum for the sinking funds established under the terms of previous loans now taken over by the South African Government, which funds now amount to £6,300,000, it is further provided by Act of the Union Parliament that any annual surplus of revenue shall be handed over to the public debt commissioners for further extinction of debt. This surplus for the year 1911-12 amounted to £681,000. Since May 31, 1910, the debt of the Union has been extinguished to the extent of approximately £2,000,000. The stock is a trustee investment.

* * * *

Namaqua Copper.

During the year 1912 the Namaqua Copper Company produced 4,482 tons of matte and 120 tons of precipitate, or practically the same as for 1911. The grade of ore treated was the same. The total cost of smelting was reduced, chiefly by reason of the lower cost under the present system of generating power by Diesel oil engines in place of steam. The available profit for the year amounted to £78,264, against £59,148 in 1911. Out of this a dividend of 15 per cent. was paid in November, and the directors now recommend a final dividend of 22½ per cent., or 9s. per share, making a total of 37½ per cent., or 15s. per share, for the year, and leaving £7,515 to carry forward, against £4,432 brought in. The reduction in the cost of power has led the management to believe that low-grade ores can now be profitably treated by first concentrating with the Elmore plant. This has been re-erected in a position convenient to the smelter, and is expected to be in operation by the middle of this month. The cost of power will then be further reduced by the distribution over a larger tonnage.

* * * *

Rooiberg Minerals.

A very good quarterly report comes from Rooiberg. The monthly profits for the quarter were:—January, £8,665; February, £7,759; March, £6,664; tons treated, 9,008; capital expenditure, £1,854. Exploration and prospecting has been vigorously pursued, and many encouraging indications have been located. Prominent amongst these is the discovery of a pocket of excellent ore on what appears to be the far southern extension of the Union lode, some 250 yards south of the European hospital site. Good prospects have also been encountered at the intermediate workings, whilst at the camp shaft and No. 15 trench, open workings, high-grade ore has been mined from the various fissures, which are being followed up. In the north-west corner of Olievenbosch South a prospecting shaft has been sunk to a depth of 50 feet in the area of ancient workings, and a crosscut south-west is now being put in to intersect a fissure from which a pocket of good ore was obtained near the surface.

TOPICS OF THE WEEK.

THE MINES AND THE NEW MEDICAL RESEARCH INSTITUTE

The mining industry has seldom been seen to better advantage than in connection with the part it has played in starting the S.A. Institute of Medical Research, the foundation stone of which was laid by Sir Kendal Franks this week. In speeches worthy of the occasion, tribute was paid by Sir Kendal, by Mr. Ross Frames, and by Dr. Watkins-Pitchford, the medical director of the Institute, to the munificence of the W.N.L.A. in supplying the funds for the undertaking, and for guaranteeing to share with the Government the cost of its upkeep. The purposes for which the Institute has been designed may be summed up from the address of the medical director. It is being established for the purpose of undertaking investigations in the cause, prevention and treatment of human diseases. The industrial diseases and those diseases which are commonly associated with the aggregation of people in South African towns, compounds, and camps will receive special attention; enquiries will, however, be made into any subject pertaining to the arts of medicine and surgery, and the domains of disease and injury. Researches will be conducted in matters of hygiene and the prevention of communicable diseases. Discoveries in connection with all such subjects which have been made elsewhere will be tested and new methods of treatment will be assayed. The wards of the Institute Hospital will give facilities for the study of disease at the bedside and for the systematic observation of the results of treatment. Statistics relative to diseases will be collected, and modern statistical methods will be employed as far as possible in recording all observations. It is proposed to acquire and maintain a library and museum, both of which will relate to the special objects of the Institute. In view of the fact that the mining industries of the Transvaal attract natives from all parts of South Africa, the advantage will be used for acquiring information and material for anthropological and ethnological research. By serving as a bureau of local information, the Institute will be of assistance to investigators in other parts of the world; endeavours will also be made to co-operate with other research institutes in the direction of collective investigation. Any knowledge which the Institute may acquire and which may be of value for the protection of the public health will be made available by publication. Technical reports of its investigations will be printed from time to time and distributed gratuitously as far as funds permit. Facilities will be afforded to registered medical practitioners for acquiring a knowledge of laboratory methods of investigation. Provision will be made in the buildings for the holding of medical meetings, discussions, and demonstrations, and popular lectures will be occasionally conducted under the auspices of the Institute. As Dr. Watkins-Pitchford reminded his hearers, the Institute has no endowment and depends at present for its income upon the Chamber of Mines and the favour of the Government. For our part we have no doubt that the Institute will not fail to justify its existence from the very beginning, and will become one of the country's most cherished institutions, a credit to the wisdom and public spirit of its originators.

THE ANTI-PHTHISIS CAMPAIGN.

Among the many somewhat stereotyped statements relating to the anti-phthisis campaign which appear in the annual company reports for the past year, it is refreshing to find the manager of the Wolhuter Gold Mining Company, Ltd., making the definite announcement that the conditions underground at that mine are of a thoroughly satisfactory kind. "In this connection I would like to remark," he says, "that the installation of the water service, together with the practice of blasting only once daily, has resulted in the mine to-day being practically free of dust, and rendered conditions underground as well-nigh perfect as it is possible to make them." This statement draws attention to the fact that the practice of blasting only once daily is a not unimportant part of the scheme adopted at the Wolhuter for the elimination of the various causes which are responsible for the existence of miners' phthisis. In other mines this custom is not universally followed, and some of those who claim to have studied the problem in question thoroughly and impartially assert that not only is the operation of blasting a contributory cause of some importance in the matter of phthisis, but that it is one of a particularly malignant and insidious kind. They maintain, therefore, that as long as it is allowed to continue without such precautionary measures as may be necessary to counteract its dangers precisely so long will miners' phthisis continue to demand its regular toll of victims and to remain a burden upon the profits of the mining industry and a reproach to those who are responsible for its methods. In a paper by Messrs. Haldane and Thomas, on "The Causes and Prevention of Miners' Phthisis," which was read before the Institution of Mining and Metallurgy on the 19th May, 1904, and in the discussion which followed, special reference was made to this matter of the dust produced by blasting. "A further problem," said the authors referred to, "is presented by the dust produced by blasting in ends and rises where rock drills are employed. Just after a blast the dust near an end is so thick that it is often impossible to see a candle a foot away. In Cornwall the men usually arrange so as not to return for a considerable time; but in the Transvaal mines it appears to be common for both Kafirs and white men to return almost at once, in spite of the dust." And further on: "So far as possible blasting should be so arranged that men remain in clear air, and do not return until the dust has cleared. The practice of returning into dusty ends or rises just after a blast, or sending subordinates or Kafirs in, should be strictly forbidden." Mr. Arthur Thomas, of Dolwath, remarked during the discussion that the amount of dust and smoke produced after a blast in the mine was considered such a serious thing that they had made a very stringent rule in order to allay the danger and to prevent men returning to ends or any other close place until the air was clear. Experiments by Messrs. Thomas and Macqueen showed that the natural subsidence of dust took 70 minutes. It was remarked by more than one of those who took part in the discussion on the question of phthisis that in the Transvaal, where very big wages were being earned and where the men tended to sacrifice their health for the wherewithal, it was customary for miners to return to the ends and faces very quickly. It does not seem to have occurred to these persons that not only big cheques but the bustling policy of the average mine manager and board of directors was to some extent responsible for the injudicious and even indecent haste to get back into the danger zone. However, that may be it will be admitted by all right-thinking people that it is the duty of those who control a mine to protect the miner against himself, if necessary, and to insist, even at the cost of some diminution of profits, that self-sacrifice of a reckless kind—or suicide, as it may in many instances be termed—shall not be countenanced, much less encouraged, upon any grounds whatever. We have no reason to suppose that these things are either countenanced or encouraged, for, however devoid of humane feelings any individual manager or his directors may be, the economic value of the working man's health and life is a consideration which cannot fail, for any length of time, to thrust itself upon their attention as a matter which has to be reckoned with. The history of the mining industry for the past few years has demonstrated the fact that neglect of this economic factor is certain to have a serious influence upon the progress of gold mining on the Rand. There is nothing more certain. The effort th [illegible] ve been made by the mining houses for many months past, at no small expense, to improve the conditions underground, has, it is generally admitted, led to a marked improvement all round. There remains the fact, however, that the diminution of phthisis has not been quite so definite as one might have expected, in view of all these efforts. The question arises, whether all possible sources of danger have been clearly perceived and combatted, and in this connection the prevalence of dust as a result of blasting operations and the methods used to obviate its effects in every way are circumstances that do not appear to have received as much consideration as they probably deserve. In order that the baneful effects of dust which is created by this means should be obviated it is not only necessary that steps should be taken to prevent men returning into a dusty atmosphere, for which purpose regulations are already in force, but that they should be removed from the dust zone before the danger appears. There are no regulations that insist upon this, and obviously the few minutes that follow upon a blast are those in which dust is most abundant and all-pervading. As a remedy it has been suggested that all persons should be removed from a mine before blasting begins and that electric firing should be adopted. Electric firing is a method in common use in European collieries, and it seems to be one which might usefully be considered from the health point of view, if from no other, upon the Rand. Even assuming that all those not engaged in the operation of blasting were usually outside the dust zone, which is probably far from being the case, there still remain to be considered those persons who carry out the work of blasting and who are commonly kept in a dusty atmosphere, from one cause or another, sufficiently long to be affected thereby. Abundant ventilation is a self-evident corollary of any proposition of this kind, and a scheme of working is required to admit of these measures being effectively carried out. The Wolhuter has for some time past been held up as a model of what may be done in the way of improving working conditions underground, and since we have the assurance of the manager that the conditions are as well-nigh perfect as it is possible to make them, the thought suggests itself that the methods in vogue at this mine might usefully be followed much more extensively.

IMPROVING UNDERGROUND CONDITIONS.

The improvements effected in underground working conditions in the mines of the Rand last year were of a very far-reaching nature, and it can be taken for granted that the expenditure incurred was put to good account. It may take some considerable time before the real effect of these disbursements is felt by the industry, but both in regard to the humanitarian aspect and the commercial consideration of efficiency the sums of money spent by the mines in 1912 to the end that underground workers may labour under more hygienic conditions can be looked upon as expenditures that have been made at bargain prices, no matter what the aggregate amounts may be. In the majority of the annual reports recently issued references are made to this aspect of the year's work, and it is highly gratifying to note that in the cases of one or two mines good results already have been achieved. Thus at the City Deep the health of the native labour force showed a very marked improvement. The average number in hospital for the year owing to sickness was 29, or 0·9 per cent., against 84, or 2·943 per cent. in 1911. Here a complete water service was installed, and systematic spraying of the workings with a solution of molasses was introduced with most satisfactory results. The Village Deep mine is now fully equipped throughout with every necessary device for improving health conditions. It is well ventilated by a large underground mechanical fan, and every part is supplied with water under pressure for allaying dust. At the Bantjes the improvement experienced in the health of the native employees is most marked, and is a gratifying result of the efforts of all concerned. The effect has been remarkable, in that a much higher percentage of natives was available for work, and there was a reduction in the average number in hospital. The Durban Roodepoort Deep mine has always been damp and comparatively free of dust, but the installation of an efficient water service underground, by which every working place can be effectively damped and the strict enforcement of the underground regulations by the mine officials will, the manager of the Durban Deep feels confident, "eradicate the phthisis scourge as far as this mine is concerned." At the Consolidated Langlaagte, as at other mines under Barnato control, the problem of miners' phthisis received very careful study during the year. We find it recorded in the report of Professor Lawn, the consulting engineer: "No expense has been spared in carrying large quantities of water underground, and in providing suitable appliances for distributing it at every point where it is required to lay the dust underground. It is gratifying to note that both officials and workmen are now much more earnest than formerly in seeing that the appliances provided are regularly and systematically used, so that there is a strong hope that this scourge will be very materially lessened, if not eliminated, in the future." At the Witwatersrand (or "Knights") a considerable amount of work was accomplished during the year in improving the conditions underground so as to get rid as far as possible of the causes which lead up to miners' phthisis. Wherever possible, water had been laid on with a view to keeping down the dust, and it is hoped by constant attention and the co-operation of the underground workmen that an all-round improvement will be effected. At the New Kleinfontein special attention was paid to allaying the dust throughout the mine, water pipes having been installed throughout the workings, with sprays and atomisers fitted wherever necessary. The Consolidated Gold Fields of South Africa Company's managers have been specially diligent in regard to bettering underground health conditions. The work carried out in the Simmer Deep is particularly worthy of commendation, and has been remarked on at length in previous issues of this journal. We have in the foregoing picked out one or two mines haphazard, not because of any special endeavours on the part of these concerns to fight the phthisis scourge, but because the examples are, doubtless, illustrative of the whole. The industry can compute in exact terms what the expense incurred has amounted to, but it is impossible to estimate the value of the harvest that will be reaped from these disbursements. The sum and total translated into terms of pounds, shillings and pence are certain to assume proportions of very great magnitude; but the temporary reduction of dividends will be more than compensated for in the near future.

THE WORLD'S THREE GREATEST GOLD MINES.

Crown Mines, East Rand Proprietary and Randfontein—Production Last Year 10 per cent. of the Output of the Globe—Four and a Quarter Millions in Profit—Ore Reserves Valued at £34,661,644—A Study in Millions.

The three leading mines of the Witwatersrand, Crown Mines, East Rand Proprietary and Randfontein Central, produced gold of a total value of £9,124,371 last year. Placing the production for the whole world at about ninety-two or ninety-three millions, this means that these three great consolidations produced between them practically 10 per cent. of the entire output of the globe for 1912, a fact which must be regarded as striking testimony to the pre-eminence of the Transvaal gold fields and the overwhelming importance of the leading mines. As further evidence of the tremendous achievements of this industrial triumvirate, it may be remarked that the Crown Mines, E.R.P.M. and Randfontein produced between them 25 per cent. of the Rand's production last year. It is also of interest to note that the total profit earned by these three properties was £4,239,739, or 33 per cent. of the aggregate profit of the Main Reef series in 1912.

Varying Characteristics.

It is instructive to note the results recorded by these three mines and to record their showings in parallel columns. There are, of course, different conditions obtaining at the properties under consideration. For instance, the Crown Mines represents a combination of the richest and most profitable gold mines of the Rand; of the whole world in fact. The amalgamation brought under one administration what may be described as the golden two miles of the Rand, and although when operated on the present large crushing basis the ultra high grade returns of the twenty stamp battery days are no longer practicable, no longer politic at any rate, the recovery of the Crown Mines consolidation last year was substantially above the Witwatersrand average. In the case of the East Rand Proprietary Mines a lower grade project has to be dealt with, whilst Randfontein again records a still smaller yield per ton milled, the recovery for last year being only 24s. per ton, or about 5s. below the average for the whole Witwatersrand. Randfontein, too, has a peculiarity in the steep dip of its reefs, a characteristic making for a lower tonnage per claim, but at the same time conducing towards economy in working costs.

Capitals, Equipment and Profits.

From the tabular statement given below, it will be seen that the Randfontein Central Company carries the heaviest capital and has a larger equipment than either the Crown Mines or the great Farrar consolidation. Although running a lesser number of stamps than the E.R.P.M., it records the largest crushing result of the three, a slightly higher output than the Crown Mines, and the lowest working costs of the trio. When, however, we turn to the profitable and dividend aspects the immense advantages of the great Central Rand property are abundantly evident. The profit per ton was almost double that earned by the West Rand mine and 2s. 5d. greater than the East Rand's showing, whilst the much lesser capital permitted of the payment of a vastly larger dividend percentage than the other two mines were capable of doing.

An Instructive Table.

The table referred to above is given hereunder. It should at the least prove instructive and help to give the lie to the many mugwumps who assert that gold mining on the Rand is a declining industry.

	Crown Mines.	East Rand Proprietary.	Randfontein Central.
Capital	£940,106	£2,445,897	£4,193,700
Property Claims	2,222	1,515	2,303
Stamps Erected	835	820	1,000
Stamps at Work	660	820	752
Tube Mills at Work	22	25	29
Tons Milled	1,920,700	1,848,050	2,573,908
Total Output	3,071,217	2,967 443	3,085,711
Total Output per ton	32s.	32s. 1d.	24s
Working Costs per ton	18s. 4d.	20s. 10d.	17s. 1d.
Total Profit	1,314,247	1,039,093	886,399
Profit per ton	13s. 8d.	11s. 3d.	6s. 11d.
Pay Ore Reserves, tons	10,607,671	6,013,300	7,600,000
Value of Pay Ore Reserves, dwts. per ton	7·09	6·8	6·2
Dividends	£1,034,117	£611,174	£209,685
Dividends, per cent.	110	25	5

Ore Reserves.

Turning to the ore reserve aspect—probably the most important consideration of all in regard to a mining company—we find the position of the Crown Mines immeasurably superior to that of either the E.R.P.M. or Randfontein. The reserves of the great Corner House mine exceed those of the E.R.P.M. by four and a half million tons and are about three million tons in excess of the Randfontein Central's tonnage. As regards value, too, the Crown Mines pay reserves exceed the average gold contents of the East Rand by ·29 dwt. and of Randfontein by ·89 dwt. per ton. Reckoning the value of a dwt. of gold at 4·247 shillings, the following interesting calculations as to the reserves of the three mines under consideration may be arrived at:—

	Total Value.
Crown Mines	£15,970,379
Randfontein Central	10,008,060
East Rand Proprietary Mines	8,683,205
Total for the three mines	£34,661,644

Expenditure and Profit Represented.

The above table is capable of classification according to profits in sight, and the sums represented in the reserves which on the bases of last year's costs will have to be expended to win the amounts of gold locked up in these tonnages. We arrive at the following statistics:—

	Working Expenditure.	Working Profit.
Crown Mines	£9,723,698	£6,246,681
Randfontein Central	6,491,666	3,516,394
East Rand Proprietary Mines	6,263,854	2,419,351

It should be fully appreciated that the foregoing tables take no account of ore at present unpayable or of the influence of lower costs on the reserves blocked out. Any economic changes of this kind will, of course, bring about substantial alterations in the aggregate value of the reserves and also of the classification according to profit and expenditure. Finally, we give a table stating the latest share market quotations (ex London) and market valuations of these mines, irrespective of cash balances and debenture liabilities, etc. The figures are:—

	Issued Capital.	Nominal Value of Shares.	Latest Market Quotation. £	s.	d.	Market Valuation on this basis.
Crown Mines ...	£1,880,212	10s.	7	10	9	£14,172,097
Randfontein ...	4,193,700	£1	1	8	9	6,028,444
East Rand ...	2,445,897	£1	2	18	3	7,184,823

We publish these latter statistics without comment. It has not been our purpose to institute any close comparison between the three mines dealt with in the foregoing. Clearly such comparisons are impracticable where such a host of complex factors and varying considerations are at play. Rather has it been our intention to indicate the enormous importance of the three great consolidations of the Main Reef series and to, in some measure, demonstrate their stability and vast potentialities for the future.

CAPITAL EXPENDITURE IN 1912.

Amounts Paid for Machinery and Materials—Some Impressive Totals.

I.—NINE "CORNER HOUSE" MINES.

The enormous market that exists, and must continue to exist, on the Witwatersrand for mining machinery, building materials, and many other mercantile lines is well brought home to one by a brief study of the annual reports of the various companies that have recently published their directors', consulting engineers', and managers' statements and balance sheets for 1912. We have before us a long list of expenditures incurred on capital account by milling companies, and when it is realised that these amounts have to be considered as distinct from the further large sums expended by mines like the Van Ryn Deep, where construction work from a bedrock basis is being undertaken, the wealth of the Rand's mining material market and the great scope and value of the field awaiting merchants should be fully realised. We would, too, point out that expenditure such as is denoted in the following is for the greater part constant and recurring. Renewals and replacements will have to be made continually in order to maintain the operating efficiency and general excellence of the Rand's equipments, than which no better are to be found on any mining field on earth. A considerable amount of work, payment for which has to be defrayed out of capital account, was not completed by certain companies at the end of 1912, so that next year, too, considerable disbursements on capital account will be called for. We admit that in 1912 the amounts set aside out of profits were remarkably heavy, and that in the future a larger proportion of earnings will be available for distribution amongst shareholders, but at the same time continued outlay on capital account must be expected. Much of the 1912 expenditure was incurred in connection with the electrification of steam plants. Additions to compressor equipments and underground water services, the effects of which should be in evidence to a gratifying degree in the near future, also called for large payments. Additions to pumping installations also figure as important items. This week we deal with the nine subsidiaries of the Central Mining and Investment Corporation group, which recently have issued their annual reports.

Crown Mines.

By far and away the largest expenditure recorded by any unit of this group was that incurred by the Crown Mines. The main construction works necessary for the concentration of operations were completed shortly after the middle of the year, and all rock mined is now being handled through the two new crusher stations at Nos. 5 and 7 shafts, the old stations at Nos. 1, 3 and 4 shafts having been put out of commission. From the new crusher stations the ore is being transported by steam locomotives to the three mills, any one of which can be fed from either of the crusher stations as required. Although small difficulties were encountered at the outset, the entire plant is now working smoothly. The chief works completed, or practically completed, during the year were:—(1) Underground pumping plant; (2) sorting and crushing station; (3) shaft equipment; (4) installations of two large winders, at No. 5 shaft; (5) extension of Butters' plant, (6) equipment of 13th level with electric haulage; (7) general surface railway system; (8) electrification of steam plants. The remaining items of importance yet to be finished are the installation of a third large winding engine at No. 5 shaft, and the third-stage winding equipment at No. 7. The expenditure on capital account was as follows: Development—No. 5 shaft, stations, ore bins, etc., £8,437 2s. 11d. Equipment—Sundry extensions to machinery and plant and buildings, etc., including equipment at No. 5 shaft, £230,966 13s. 3d.; less plant sold, £676 4s. 1d.—£230,290 9s. 2d.; total, £238,727 12s. 1d.

Bantjes Consolidated.

At the Bantjes Consolidated the following additions were made to mine equipment during the year:—The 10th level pumping station was completed and equipped with two 8in. x 4½in. three-throw Worthington pumps. The air compressor plant was increased by the addition of a 560 h.p. Parsons' turbo compressor, which is now regularly in use and running satisfactorily. The net expenditure on capital account for this company figures at £8,581, of which £3,342 was on underground pumps and £4,341 for the Parsons' turbo compressor.

Durban Roodepoort Deep.

Here the expenditure was as follows:—Concentration of pumping plant, £14,804 1s. 11d.; additions to native hospital, £5 14s.; married quarters, £750; telephone installation, £333 2s. 9d.; experimental laboratory, £203 3s.; electrification of steam plant, £34 10s. 8d.—£16,130 12s. 4d. Less sale of equipment as under:—Ventilating fan, £196 12s.; Florida dam pumping plant, £900—£1,069 12s.; total, £15,034 0s. 4d. The continual flooding of the lower portion of Nos. 2 and 3 shafts, owing to defective pumping plant, did not enable the management to deepen these shafts, and prevented the commencement of the main haulage on the 12th level at these points. The pumping plant at present in use was kept running, but was not satisfactory, and constituted a continual source of trouble and expense. The new pumping plant will soon be completed, however, and will be a great help towards the economic working of this mine.

City Deep.

This company expended on capital account £12,272. The largest individual item on the list is reduction plant, £3,939. General surface equipment called for £2,837; underground winders, £1,236; an air meter station, £783; and on Nissen stamps £656 were expended.

Geldenhuis Deep.

At this property the expenditure was as follows:—Pumping plant, £5,324 13s. 6d.; steel headgear, bins, etc., at No. 2 shaft, £5,000; electrification of steam plant, £4,580 9s. 5d.; underground winding engines, £3,943 4s. 6d.; electric tramway between sectional crusher stations, £3,318 1s.; compressed air meter plant, £418 13s. 4d.; underground ventilating plant, £201 12s. 9d.—£22,786 14s. 6d. Less credits for plant, etc., sold, £152s. 18s. 6d. Total, £22,633 16s. 0d.

MODDER B.

At the Modderfontein B, the most easterly subsidiary of the group, there were spent on capital account £22,797, of which £10,357 was for underground equipment, £2,295 on power and plant, £1,382 on account of change houses, and £1,241 on a drainage system.

ROBINSON.

This company's net expenditure on capital account was £2,918, the greater part of this (£2,613) being absorbed by the installation of a sands-filling plant.

ROSE DEEP.

The expenditure was as follows:—Electrification of steam plant, £1,007 1s. 11d.; electrification of and alterations to Cochrane hoist, £2,000 19s. 9d.; sand-filling plant, £1,372 18s. 5d.; two air meter stations, £562 17s. 10d.; New Primrose joint hospital, £304 7s. 7d.; alterations to fire service system £730 17s 1d.; total, £5,979 2s. 7d

VILLAGE DEEP.

The Village Deep's total capital expenditure was £42,428. The principal items were:—No. 3 shaft equipment, £17,053; electrification of steam plant, £12,171; 16th level underground haulage, £3,614; main hoist at No. 2 shaft, £3,443.

The totals of these amounts stand as under:—Bantjes Consolidated, £8,581; City Deep, £12,272; Crown Mines, £238,728; Durban Roodepoort Deep, £15,034; Geldenhuis Deep, £22,634; Modder B, £22,797; Robinson, £2,918; Rose Deep, £5,979; Village Deep, £42,428; grand total, £371,371. Since numerous disbursements were subject to deductions on account of machinery sold, etc., the gross amount spent by the nine mines dealt with above would be in the neighbourhood of £400,000.

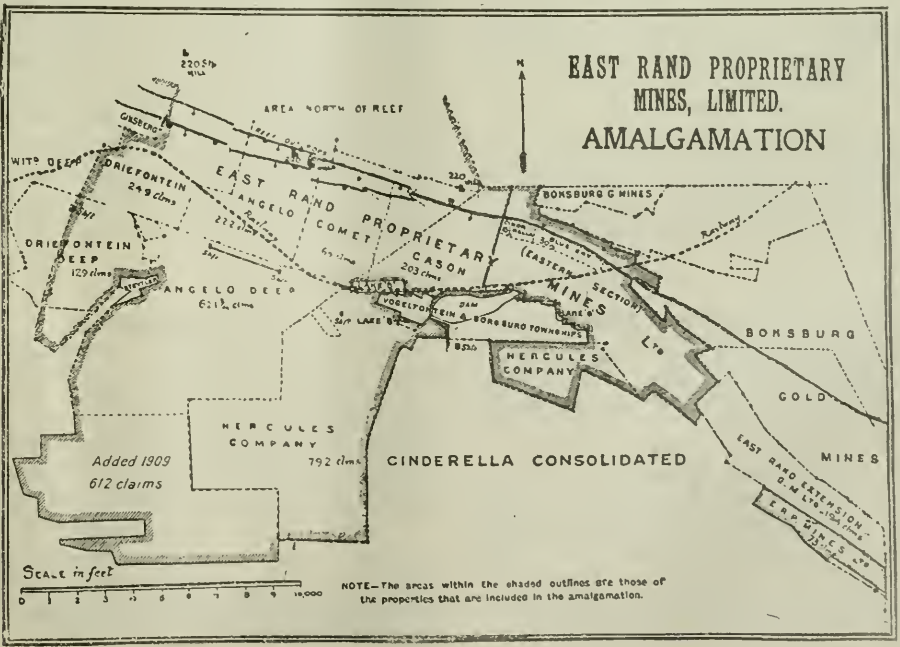
E.R.P.M.—REEF STRUCK IN THE HERCULES.

Importance of the Intersection—Effect on Future Working—High Values in the Crosscut.

INTERSECTION of the reef in the Hercules vertical shaft of the East Rand Proprietary Mines is an event of the very highest importance to that company, and the development results obtained from this shaft will be awaited with the very greatest interest both in South Africa and Europe. The reef has now been disclosed on both sides of the shaft, and it must be admitted that at this point values are poor. However, no great measure of importance can be attached to this disclosure as the quantity of ore at present exposed is obviously infinitesimal. It should, too, be observed that the crosscut from this shaft on the 3,000 ft. level has given highly satisfactory values.

THE OFFICIAL STATEMENT.

The full text of a cablegram despatched to the London office of the E.R.P.M. Company on Monday night is as follows:—"The Main Reef series was intersected in the Hercules vertical shaft at a depth of 4,236 ft. The reef has now been disclosed on both sides of the shaft, with the following results: Main Reef Leader, width 13 inches, value 3·2 dwts.; Main Reef, width 19 inches, value 1·8 dwts. The Main Reef Leader is a compact, highly-mineralised ore body, of good appearance. The Main Reef consists of three leaders—one nine inches, and two each five inches wide. The crosscut from the above shaft on the 3,000 ft. level has intersected the Main Reef Leader during the past week. The average value for 25 ft. driven is 93 dwts. over a reef width of 13·2 inches. Resampling gave a slightly higher value." Quite apart from the question of values, the importance of this shaft to the future working arrangements of the company should be recognised. We reproduce herewith a plan showing the extent and relative situations of



the properties included in the East Rand amalgamation scheme, from which the value of the Hercules shaft as a means of deeper level exploitation will be evident. It should be remembered that during last year the main incline shaft of the Cason was sunk to its maximum depth of 4,911 feet. It is intended that all rock mined below this depth shall be hoisted through the Hercules vertical shaft.

RESUMPTION OF SINKING.

Early last year it was decided to resume the sinking of the seven-compartment vertical shaft at the Hercules section, operations at which had been stopped at a depth of 3,018 feet some years ago. The shaft was de-watered in April, and a station cut at the 3,000 ft. level in order to cross-cut to the Main Reef series on the plane of the Cason 23rd level. The total footage sunk in the vertical shaft during the year was 919 feet, making its depth at 31st December, 3,937 feet. The cross-cut mentioned above was expected to intersect the reef at approximately 1,200 feet, of which 677 feet had already been accomplished at the end of 1912. It was estimated that the reef would be struck in the shaft in March at a depth of, approximately, 4,250 feet. The actual depth at which reef was encountered was, it will be observed, in close accordance with this estimate. Sinking will be continued to a depth of 4,500 feet in order to permit of the construction of the necessary ore-bins, sumps, etc.

A REMEDY FOR ACID MINE WATER.

Calcined Soda Being Experimented With—Results of a Comparative Test—Complete Solubility, Efficiency and Cheapness.

WE understand that some interest is being taken by one or two of the mines with regard to the value of calcined crude soda ash as compared with lime for the neutralising of acid water, the advantage of the former being said to lie in its complete solubility and its cheapness, no less than in its neutralising effect. The following details of a test made by Mr. W. B. Marshall, Ph.C. (Lond.), in this connection are instructive.

COMPARATIVE TEST.

Crude calcined ore (soda) v. lime in the neutralisation of acid water (H_2SO_4):—Crude soda, 64 per cent. and lime 70 units used. Theoretically 165 parts Na_2CO_3 64 per cent. =86 parts lime 70 units. Two baths taken containing 5 gallons water and $\frac{3}{4}$ quantity of sulphuric acid required to neutralise 35 grains Na_2CO_3. Added 35 grains CaO to one bath and 35 grains Na_2CO_3 to the other. Stirred for 5 minutes. 100 c.c.s. of each taken and titrated with $\frac{N}{100}$ H_2SO_4. Soda solution required, 30·8 c.c.s. Lime solution required, 25·9 c.c.s. Test repeated after a further two hours:—Soda solution required, 30·8 c.c.s. Lime solution required, 28·5 c.c.s. Thus demonstrating the greater actual efficiency of the soda.

CALCINED CRUDE SODA.

The calcined crude soda ash, containing about 70 per cent. real Na_2CO_3 is recommended for neutralising and softening water in place of lime; from two points of view, viz.:—Efficiency and working costs. Sodium carbonate is a readily and totally soluble chemical, giving a soluble product—sodium sulphate—which is not a cyanicide. There is no loss of undissolved material. Experiments prove that though, weight for weight, lime is theoretically capable of neutralising more acid than soda, yet, owing to the slow rate of solution of the former, soda is actually more efficient. Demonstrations of this can be given. As only a small percentage of the soda ash is insoluble, and the product of neutralisation is soluble, the problem of choked pipes is solved by the use of crude soda instead of lime. The above remarks re solubility apply equally to the case of softening water for boilers, with the additional advantage in favour of soda that "permanent hardness" (so-called) is also removed. There are no impurities, such as iron, aluminium, magnesium, calcium or sulphates to cause trouble. The soluble impurities present being chloride and a trace of potassium. The cost is very similar to that of lime.

OTHER SODA PRODUCTS.

Among other products manufactured by the South African Alkali, Ltd., are pure soda crystals (washing soda). These soda crystals are exceptionally pure. In the course of manufacture a process is adopted to produce large hard crystals. A noticable feature is the length of time the crystals can be exposed to air without efflorescence, except on the surface. Their freedom from chloride and other impurities is remarkable. The average of the chloride is under 1 per cent., and in the re-crystallised variety, which will also be supplied, there are only minute traces. Reference to the analyses of the product shows the remarkable purity and strength of these crystals compared with Tyneside standards. Refined alkali: This product is to be manufactured in two varieties—powdered and granulated. Samples have been made of a high degree of purity at a small cost. It is intended that caustic soda and bicarbonate of soda will be manufactured in due course.

Bantjes Consolidated Mines.

The following cable message has been sent to the London office of the Bantjes Consolidated:—"Profit for month is expected to be abnormally low, owing to fluctuation grade and break-down hoist. Drop in grade may be considered temporary. Hoist at work again."

Robinson Group.

The following are the results of operations by the Robinson group for March:—Langlaagte Estate: Milled, 55,201 tons; total yield, 13,947 fine ozs.; estimated profit, £15,000 (5s. 5·21d. per ton milled). Randfontein Central: Milled, 234,407 tons; total yield, 66,126 fine ozs.; estimated profit, £81,588 (6s. 11·53d. per ton milled). A total tons milled of 289,608; grand total yield of 80,373 fine ozs.; with a total estimated profit of £96,588.

New Kleinfontein.

The report on operations at the New Kleinfontein mine for the three months ended the 31st of March, states that 346 feet of shaft-sinking was accomplished, and on development 3,651·5 feet were driven, risen and sunk. The footage sampled was 2,825 feet, the average milling width being 41·92 inches, and the average assay value 8·21 dwts. From 149,600 tons milled the estimated revenue was £209,686, or 28s. per ton. Working costs absorbed £137,298, or 18s. 4·264d. per ton, which left a net working profit of £72,388, or 9s. 8·131d. per ton. Capital expenditure for the period was £8,251. The ore reserves at the end of the quarter were as follows:—Payable: 1,184,325 tons; milling width, 46·24; value, 7·63 dwts. Unpayable: 516,502 tons; milling width, 45·48; value, 3·63 dwts. Totals and averages: 1,700,827 tons; milling width, 46·00; value, 6·41 dwts.

VAAL RIVER PROSPECTS.

Schemes for the Dry Season—The Wealth of the River Bed—The Steam Pump and the Caisson.

The approach of the dry season of the year has revived once again various schemes for working in the river bed along the Vaal River, and breakwaters and dams which will cost many thousands of pounds are being planned, in order that the unquestionable riches of the deeper pools may be secured. Many tales are told of the fortunes which have been realised now and then by those who have succeeded in draining some of the more favourably situated diamond traps, and among them is the story of some divers from the Cape coast who appeared one day upon the banks of the Vaal with all the equipment of their trade, and, during a brief holiday, rolled in the wealth which they secured as the result of their sub-aqueous labours. However that may be, it is certain that in some parts of the river the alluvial gravel which is dug and washed with considerable toil by many thousands of dry-diggers along the banks, has been subject to a prolonged and effective concentration year by year in pools naturally adapted to the process, and that rich deposits of diamonds await the persons who are lucky enough to locate one of these treasure houses, and able to overcome the difficulty of the deep water. A famous attempt to attain success was that of the Dreadnought which was for years an object of melancholy interest in the stream just below the Barkly West bridge. Dredging has not been commercially profitable in this country either in gold mining operations or for the purpose of working diamondiferous alluvial gravel, the large boulders which are so commonly found in the river beds being the chief obstacle to their employment. The Barkly West dredger referred to was the first of its kind, and as great things were expected of it no expense seems to have been spared in its erection: it will probably be the last also to be introduced into South Africa for that specific purpose. An alternative scheme has been the construction of caissons or diving bells, and reference has been made to various types in this journal. In 1909 the prospectus of the Caisson Diamond Syndicate, Ltd., appeared in which it was stated that the nearest approach to the solution of the problem under discussion was the air-lock caisson designed and built by Mr. P. Macadam, and operated near Windsorton. This apparatus is said to have proved the feasibility of extracting gravel from the deep pools, and it was alleged that if it had only been designed upon a somewhat larger scale, it would most undoubtedly have proved a success. There were various defects encountered and the Caisson Diamond Syndicate announced that they had made improvements in design which entirely obviated these faults, and would enable them to deal with from 25 to 40 loads per day, whereas Macadam's caisson was only able to handle about five loads per day. On this basis a daily profit of £8 was anticipated. The proposed site of operations was at a spot situated about eight miles east of Christiana, at a point where the Vaal River intersects the diamondiferous kopjes of Kromellenboog and Kalkfontein. The river here forms a pool of considerable area and depth, a basaltic bar running across its lower extremity. At a wash-up in this pool where the stream bifurcates by reason of a large island, and where two breakwaters were constructed, the stream being diverted to the channel on the Transvaal, 1,500 carats were obtained in four months. The water was got rid of by pumping, but it was considered that a caisson would meet requirements more satisfactorily on a large scale. The subsequent history of this venture was not published, but inasmuch as the enterprise was abandoned it is safe to conclude that the caisson employed was not more of a success than that of Mr. Macadam, which it was intended to supersede.

The Latest Caisson Venture.

The caisson idea, in spite of these failures, still finds favour, the most recent effort in this direction being that of Mr. Cox, a digger and inventor well known on the river diggings. We are unable to say whether the necessary funds for this undertaking have been accumulated, but it was reported a little time ago that preparations were being made to explore a pool near Kromellenboog, presumably the one described above. Mr. Cox, like the Caisson Syndicate before him, claims to have overcome all difficulties inherent to the use of a diving bell type of apparatus, and an examination of the model exhibited here by him a few months ago certainly leads one to believe that as far as the caisson itself is concerned it is admirably adapted to sub-aqueous work. The question remains, however, whether it will be possible to deal with the boulders of the river bed sufficiently easily within the somewhat circumscribed limits of the working chamber in order to enable a quantity of gravel to be sent to the surface which will pay a reasonable profit. The essential to success, in this as in every other kind of mining operation, is that it should be possible to handle an adequate amount of material, and until it has been demonstrated practically that a caisson of convenient size and not too prohibitive in the matter of cost can be relied upon to meet this requirement, the scheme must continue to be regarded as an experiment.

A Pumping Proposition.

Further down the Vaal River, at a spot about five miles east of Christiana, and therefore in a well-known diamondiferous neighbourhood, is another pool, of which the area has been estimated at about 108 ordinary claims of 30 by 30 feet. A basaltic bar runs across its lower extremity, and it is stated that the natural conditions in this pool have been particularly favourable for the accumulation and concentration of a very large quantity of diamondiferous gravel. The Vaal River Pool Diamonds, Ltd., with a nominal capital of £5,000 in 5s. shares, of which the working capital of £1,000 has been guaranteed, has been floated to undertake the exploitation of this deposit. It is intended to construct a dam for a length of about 100 yards from the river bank to an island in the stream which forms one side of the pool, and, as soon as the season permits, to instal a steam or oil driven pump in order to drain the water out with the least possible delay. In order that subsequent rainfalls may not prove an obstacle, it is intended to lay down a line of rails and to draw out the gravel as quickly as it can be done, leaving the washing operations to be carried out as may be convenient. There is thus no prospect of any of those difficulties which may reasonably be expected to follow the use of a caisson, for the work will be done in the open air with all the advantages of abundant working room and ample light. The absence of danger is an important feature in this kind of work, and, given the usual favourable spell of fine weather which prevails during the winter season, there seems no reason to assume that the enterprise is likely to fail in any respect. The only feeling of uncertainty that can be entertained is with regard to the quantity of diamonds likely to be found, and on this head the promoters have little anxiety. Both above and below the pool large numbers of diamonds of good quality and size have been found by river diggers, and it is asserted that the discovery of the larger stuff above and the smaller below the site of the pool justify the assumption that the latter has acted as an effective trap for the large kind of stones. Work done upon a small scale on one of the banks of the pool, some time ago, actually proved the existence of diamonds in the wash, and it is believed that the deposit is likely to give a handsome return on the capital expended. Work has already been taken in hand, and since the necessary money has been provided not a day will be lost in getting into the river bed.

Specimen copies of the *South African Mining Journal* can be had from our offices at 125, Salisbury House, London Wall, E.C.

IRON ORE DISCOVERIES IN SOUTH AFRICA.

Rich Deposits in Griqualand West.

In the course of his speech on the Budget in the House of Assembly last week, Sir Lionel Phillips made reference to a recent mineral discovery, which he declared might prove of the utmost importance to South Africa. A few days later a letter, over the signature of Lily Currie, Klipfontein, Postmasburg, appeared in the columns of the *D.F. Advertiser*, in which she said: "The richest and purest iron ore on the face of the earth—as geologists can testify—occurring in large quantities, and containing 70 per cent. of pure iron, and absolutely no sulphur or 'phosphor,' therefore easily converted into steel by the ordinary process, can be found in inestimable quantities in the Ward of Blink Klip, Postmasburg, Hay Division, extending for many miles in a southerly direction, and northwards past Klipfontein into the Kuruman district, Bechuanaland, literally forming billions upon billions of tons of iron ore 'in sight,' *i.e.*, above the surface. This ore is heaped up in mountains and hillocks, extending about 40 miles, and having a variable but very liberal width or breadth. A specimen of this ore is being sent by wagon to the Kimberley Museum, and, therefore, will soon be on view. Besides the iron ore, other mining ventures would be exploited, as it is a well-known fact that payable deposits of copper, galena, and asbestos occur both in the Hay and Kuruman districts. The consignment of four tons of this ore was on view at the Kimberley Agricultural Show this week. It is stated that Sir Hugh Bell, the great ironmaster, recently inspected the ore deposits, but in the absence of an analysis it would be unwise to express any definite opinions as to their value.

TRANSVAAL MINERS' PHTHISIS SANATORIUM.

Review of Work of Institution During 1912.

The third annual meeting of this institution was held in the Chamber of Mines on Wednesday, 16th March, at 3 p.m. There were present:—Mr. Julius Jeppe (chairman), Dr. J. M. Mehliss, Messrs. W. Moses, E. J. Renaud, N. J. Scholtz, H. O'K. Webber, Dr. F. Aitken (medical superintendent), and Mr. W. Gemmill (secretary). The chairman, in moving the adoption of the report and accounts for the year ended 31st December, 1912, said:—

The report of the Board of Directors of the Transvaal Miners' Phthisis Sanatorium is in your hands, and gives you all the necessary details of the work carried on by our Institution during the year 1912. The audited accounts attached thereto clearly show the financial position as on the 31st of December last, and in addition to this you have also the Medical Superintendent's report dealing more particularly with the results of our year's work in the interests of humaniy. Before formally moving the adoption of the report and accounts I would ask your permission to touch upon one or two matters in connection therewith. I need not refer at length to the accounts, except to call your attention to the fact that our ordinary expenditure on maintenance for the year has been £12,257 14s. 1d., contributed by the Government of the Province and the mining companies affiliated with the Chamber of Mines. You will remember that it was in 1909 that the mining companies decided to build a Sanatorium for patients who were suffering from miners' phthisis, and that the Sanatorium was opened to receive patients at the end of 1911. At that time it was not understood that the Miners' Phthisis Act would be introduced providing for direct levies upon the mining companies for the purpose of paying compensation to victims of miners' phthisis, and monthly contributions from the companies and from the men themselves. But although the Act practically introduced a second and much larger levy upon all mining companies who were contributors to the building and maintenance of the Sanatorium, yet they decided unanimously that the objects for which the Sanatorium had been instituted should be respected, and the Institution kept open for the purpose of receiving sufferers from the disease free of charge. The results of this policy have been most gatifying to those who have been responsible for keeping the Sanatorium open. The Medical Superintendent's report will show you that it has been possible to discharge a number of patients after careful treatment as fit to do light work on the surface, and it is evident that to such men the period of rest and the careful attention received during their stay at the Sanatorium has been of great benefit. It would appear at first sight that it might be easy to obtain employment on the surface on the gold mines for men who have so far recovered their health at the Sanatorium that they are able to resume earning their living; but, although the companies have done what they could, it must be remembered that there are many white employees on the mines who, finding their lungs affected underground, make applications for any vacancies on the surface, and it is natural that the first vacancies should be given to such men. One might justly say that the proper place for such men is on the land, and the possibility of so employing them will, I am sure, be carefully considered during this year. I have the pleasant duty to perform of congratulating the Medical Superintendent, Dr. Aitken, and Miss Snape, the Matron, and her staff of nurses, and the other officials at the Institution, not only on the manner in which they have performed their arduous duties, but on the sympathetic spirit in which they have devoted themselves to their work. A visit to the Sanatorium, a glance at the care bestowed, not only on the patients themselves, but on the gardens, and on everything connected with the building, and a chat with some of the patients, who after careful treatment have been restored once more to the pleasure of living, shows that the Miners' Phthisis Sanatorium has indeed proved itself of great benefit to many victims of the disease. No pains nor expense have been spared to try to make the patients comfortable, a fact which largely accounts for our large expenditure on maintenance. Your accounts will show you that the sum of £161 0s. 8d. has been devoted during the year to a Recreation Fund from contributions derived from the small fines inflicted upon miners for breaches of the regulations on the mines, and sent at the request of those miners to swell the Recreation Fund at the Sanatorium. On the recommendation of Dr. Aitken, a billiard table and several appliances for games have been purchased on account of this fund. The Doctor also hopes that a little poultry farming or other light occupations may be established for the purpose of interesting the patients who are able to perform light work. Concerts have from time to time been given, and the Mine Managers' Association and the Transvaal Miners' Association generously helped towards the entertainment of patients during the Christmas week. It is gratifying to record the mark of appreciation shown by the members of the Miners' Phthisis Board, who visited the Sanatorium for the purpose of hearing evidence in cases of applications for relief under the Act. They report "that the patients themselves were unanimous in their appreciation of the attention and services rendered to them, for everything possible is provided for their health and comfort." I have great pleasure in thanking the Administrator of the Transvaal Province on behalf of the Institution for having undertaken the sinking of a borehole near the Sanatorium at the expense of the Administration of the Province. This borehole is giving an ample supply of good water. I have also pleasure in thanking the Public Works Department of the Government and the Municipality of Johannesburg for having constructed an excellent road to the Sanatorium from the town, and I would again this year record the gratitude of the Board for the assistance they have always received from Mr. W. Hosken and his co-directors of the Dynamite Factory, from Mr. Cullen the manager and Mr. Colquhoun, the assistant manager. Before closing I would ask you to join me in expressing our high appreciation of the services rendered during the year by Mr. Gemmill as secretary. Mr. Gemmill has not only performed his duties as secretary excellently, but has shown a keen personal interest in making everything run smoothly. I now beg to move the adoption of the report and accounts. The report and accounts were adopted, and Mr. Thomas Douglas was re-elected auditor for the current year.

New Heriot G.M. Co

The report for the quarter ended the 31st of March at the New Heriot, states that 895 feet on development were driven, risen, sunk, etc. The ore crushed was 33,480 tons; gold recovered was £57,936, and £1,885 was recovered from treatment of accumulated sands and slimes, making a total of £59,821, or 35s. 9·466d. per ton from all sources. Working costs absorbed £35,577, or 21s. 3·416d. per ton, which left a profit of £24,344, or 14s. 6·05d. per ton. In January the mill engine was stopped for two and three-quarter days for repairs, which were duly effected.

Rhodesian Section.

LATEST MINING NEWS.

A Record Output—The Texas Mine—The Gold Fields Company and Construction—Position at the Wanderer—The King's Syndicate—Shamva Developments—Activity in the Hartley and Umtali Districts.

The gold output for March constitutes a record with 61,274 ounces, value £257,797, being an increase on the preceding month of 11,679 ounces, value £49,053, ahead of the previous largest return—57,890 ounces in August, 1911—by 3,384 ounces. The Globe and Phoenix is mainly responsible for last month's increase.

* * * *

The Texas Mine in the Victoria district, owned by the Mazoe Mines, Ltd., has been taken over on tribute by Mr. G. Scott. The mine re-started crushing at the beginning of the month, when five stamps were dropped with the usual ceremony by Mrs. G. H. Fryer, wife of the engineer. Several visitors were present, including Mr. E. H. A. Cohen, Superintending Engineer to the South African Prospecting and Concessions Syndicate, Ltd. This gentleman came over from his company's Empress-Palmeira Mine, and in thanking Mr. Scott on behalf of the visitors, made a very interesting speech. The returns from the Victoria district have been very small lately, and the re-starting of the Texas is welcome news. We understand that five more stamps are in course of erection.

* * * *

Mr. H. A. Piper, accompanied by Mr. Webb, the Chief Consulting Engineer in Johannesburg of the Consolidated Gold Fields, has been on a tour of inspection to their various properties in Mashonaland, and it will be a matter of satisfaction to most people to know that over 900 tons of mining machinery, including two tube mills, are lying on the railway metals in Salisbury, ready for transport to the Shamva Mine immediately the new line is taken over from the contractors, which it is stated will be *un fait accompli* some time this week. To the Railway Trust this wholesale movement of machinery will no doubt be very gratifying. The railway rates for the conveyance of the machinery and plant to the Shamva, the Planet-Arcturus, and the Golden Kopje are estimated by the Gold Fields people at a quarter of a million sterling, though the Chief Traffic Manager of the railway hopes to reduce that figure to £230,000; and, in this connection, it may be interesting to call attention to a letter from the chairman of the Salisbury Chamber of Commerce, which appeared in the *Herald* on Thursday, in which Mr. Milne calls attention to the fact that the railage on 1,500 drums of cement, the Home value of which is £457, will cost for transport from Beira to the Shamva no less a sum than £2,364 7s. 6d., or nearly five times its value.

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The consulting engineer of the Wanderer (Selukwe) Gold Mines, Mr. Noel Griffin, cabled from the mine, under date March 15:—" Under present circumstances fully expect to work full time until end of June with profit. New chute opening out well; tonnage developed, 10,000; average assay value, not reduced, 9 dwts.; average assay value, reduced, 5 dwts. At the end of June we do not think that we shall be able to produce more than 6,000 tons per month, as we expect Camperdown mine worked out. If after four months development prove extension of new chute to have 80,000 tons reduced, average assay value 4 dwts. 12 grs. mill shall be able to work profitably on the basis of 6,000 per month for twelve months." Office note.—The above estimate is in reply to a cable asking what influence upon the life of the mines the new strike (as to which a preliminary cable was published on the 26th ult.) might have.

The King's Syndicate are making extensive additions to the plant of the Tuffnut Mine, Bembesi. In connection with these, the tender of Messrs. Hogarths Metal Works, Ltd., for the erection of a complete slimes plant has been accepted. The plant comprises three 25 ft. tanks, two 20 ft. dia. launder tanks, two sumps, one storage tank, two clarifier tanks with gratings, mats and cloths, five sets of decanting pipes and one extractor box. The work is being proceeded with immediately in order that the new plant may be put into use at the earliest possible date.

* * * *

Excellent results are being shown by recent developments on the Shamva mine. The following is the copy of a cable despatched by the local office to the head office of the Shamva Mines, Ltd., London, dated the 14th April, 1913:—" No. 4 level.—First cross-cut now completed showing width 80 ft., average assay value 5·55 dwts. Stop. Referring to our telegrams March 31st—Second cross-cut width to date 25 ft., average assay value 6 dwts., continuing both faces."

* * * *

In the Hartley district a number of new mines are being actively exploited, and at a number of properties crushing operations are being resumed. It is reported that the reef that has been discovered between the Tyne and the Pickstone in very promising. Samples averaging an ounce have been secured. The mill and plant on the Choiseul have been taken over by Messrs. Jose and Munro, who are crushing from the Duke reef. Crushing has been re-started on the Dowry, the Rosherville, the Dreadnought, and the Grogram. The Crozleigh Syndicate intend having a trial crushing of the ore from the Trinidad at the Milky Way mill.

* * * *

In the Umtali area the latest news is to the effect that the return from the Pilgrim Mine for last month is approximately £1,400 from 528 tons crushed. The Champion mine tribute has been secured by Mr. J. Buchanan of the Cairndhu. Mr. Markham, who expects to start crushing shortly, from his " Two Sisters " claims, near the Quagga, with a (1,250) two-stamp mill, has 300 tons of ore at grass from which he estimates to get 12 dwts. The reef is looking well. The Montezuma continues to do well. Mr. Buchanan has secured the Champion tribute, and, with his previous experience, should prove highly successful with his venture.

The *Berliner Tageblatt* says that there is a very active market for German diamond shares. The Pomona Company's shares in outside dealings rose to 620 per cent. on the expectations of a large dividend. The position of the German Diamond Company is also very satisfactory. A 38-carat stone, the largest ever found in German South-West Africa, was discovered on the property of the company.

ROOM AT THE TOP

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine-drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics. — E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, corner Eloff and Pritchard Streets; Box 2061.

OFFICIAL REVIEW OF RHODESIAN MINING PROGRESS.

Points from Report of Secretary for Mines.

The report of the Secretary for Mines (Mr. E. W. S. Montagu) for the year 1912, has just been issued. It reads as under:—

The steady development work drawn attention to in my report for 1911 on some of the larger mines which have not reached the producing stage was the principal feature in the year under review, and the results have proved so satisfactory that there is no prospect of a diminution in sinking operations or in the opening up of ore reserves. In a few cases the ore developed exceeds one million tons, which is a position not attained before in Rhodesian mining prior to crushing. It may be disappointing to the general public that the monthly output of gold does not show an appreciable increase, but as far as the mining industry is concerned the most satisfactory feature in its existence is when costly development work justifies continued expenditure and reefs maintain their values as such work progresses. The sound principle of extensive development on good mining prospects, before erection of crushing plant, cannot be too highly commended, and the close of 1913 and commencement of 1914 should see some large new producers in the field, whose development work and ore exposed will be of such magnitude as to cause the owners no anxiety for some years of the mill getting ahead of the mine. While this development work is proceeding, the results of which will so greatly benefit the future, it is satisfactory to note that the output of gold for the year has not shown a decrease, but an increase. We have not had to look backward in the output, and I see no reason why we should not record a distinct increase in the present year, but in a quartz mining country the lives of mines are more uncertain than with a conglomerate such as in being worked at the Witwatersrand. The disquieting feature in the present situation is the marked decrease in prospecting, and it appears to me that the time has arrived when prospecting should be systematically carried out by qualified prospectors, under the supervision of mining engineers. The mines now under process of development have been known to us for some time, but with a few exceptions nothing of value was exposed by prospecting during the year under review. Facilities to small workers, both in matter of obtaining technical advice and assistance in developing and working their properties, have recently been advertised, and I trust will lead to good results, but a step further should be taken in judicious expenditure on prospecting under proper supervision. The great majority of old workings are registered to-day, and are being worked or kept current by claimholders, whilst some have been prospected and abandoned; but what we now want is the systematic prospecting of new ground which was never touched by the ancients. It is most improbable that all our gold reefs are confined to old workings, or ground near them, and overburden may first have to be penetrated. This the prospector working for himself has not the means to carry out, but prospecting parties, properly financed and supervised, would, on the discovery of new reefs, open the way for more general work on areas thus prospected.

The unprecedented drought through which the country has passed has adversely affected mining operations, both as regards a sufficient quantity of water and the high price of maize. The latter chiefly affected the small workers, who were unable to make contracts for large supplies in the early part of the year, and in consequence had to pay a very high price later on. The bigger mines were in a better position, as they entered into contracts for a year's supply at a reasonable figure. Labour, on the whole, was not a pressing matter, as it was fairly plentiful, and the calls upon it were not so great as usual. In some districts and on some mines a scarcity was reported, but this may be attributed in a measure to those mines not being popular with the natives. The excellent work of the reorganised Labour Bureau resulted in a more systematic recruitment of labour, and it was noticeable that the Bureau was more popular with the natives and the mining public than heretofore. The labour was more carefully selected, and better arrangements were instituted to bring it down to employers, and the industry was enabled to rely on a more regular monthly supply. The chief trouble in the past has been a fair supply for some months in the year, and a serious diminution in others; but in 1912 the position in this respect showed an improvement, and claimholders could in consequence lay out their work in a more systematic manner. The monthly average of native labour employed was approximately 34,500, of which the local labour was 13,000. The mortality rate was 35·83 per thousand per annum, which shows an increase on 1911. The deaths in 1912 were 31·11 from disease and 4·72 from accidents. Both causes are receiving careful attention, and during the year amended regulations for the better prevention of accidents, more especially from blasting and gassing, were considered by the Mines Department and the representative institutions of the mining industry, and amended regulations will shortly be promulgated. The railway from Salisbury to the Shamva Mine through the Mazoe district, which will soon be completed, will materially aid mines in that district in securing lower working costs, and the broadening of the gauge to the Eldorado Mine, Lomagundi, will be of great assistance to the industry in that district. The line under consideration to the Arcturus Mine will serve the Enterprise district, and with the railways now in existence and the additions in progress or shortly to be commenced, most of the principal mines of the country will have easy railway facilities. The actual number of producers of gold in the year exceeded that of 1911 by 65, the figures being 409 in 1911 and 474 in 1912. The largest number of producers appear under Ordinance 10 of 1907, under the royalty basis, viz., 424, whilst 38 were under commuted claims, and the remainder, except 7 alluvial producers, under Government Notice No. 212 of 1904. The gold production in 1912, as compared with the previous year, shows an increase of 14,286 ozs., valued at £59,473. The total production for the two years is as follows:—1911: 628,521 ozs., value £2,647,896. 1912: 642,807 ozs., value £2,707,369. The year under review again marks a record in the production, and it certainly would have been higher if shortage of water had not been experienced at some mines, and reduction of labour at others, owing to the high price of foodstuffs. Some mills had to close down for one of the above reasons, and in other mills a smaller number of stamps than those erected could only be used. As far as water is concerned, the excellent rains which have fallen in 1913 will replenish springs and rivers, and difficulty in this respect will probably not be felt, but there is every chance of a high price for maize, which will raise working costs, and small workers will feel the pinch. A few of the bigger mines now in process of development may commence crushing operations towards the end of the year, and as the tonnage they will deal with in each month will be large, a few months' crushing will materially aid the output of gold. On the principal crushing mines in the country the full stamping power was well maintained, and the improvements effected in machinery and reduction plant resulted in the maintenance of a good percentage extraction. The production of gold has been improved upon, and further development work has in many cases been very satisfactory. Amongst the smaller workers the mills were kept very well at work on the whole but of course in this class of worker there are many who only crush for short periods, then cease for further development of ore, and recommence later. The silver production amounted to 176,532 ozs., valued at £20,010, which, though smaller in production than in 1911, shows an increase in value of £690. The bulk of the silver production was obtained from the Penhalonga Proprietary Mines, as also was the lead output, which amounted to 588 tons, of a value of £9,253. A decrease in output was noticeable in this production of 50 tons, but, owing to the higher price obtained for the metal, there was an increase in value, as against the previous year, of £1,131. A gratifying feature in the mineral output of the country is the steady annual increase in the output of chrome ore from the claims of the Rhodesia Chrome Mines, Ltd., at Selukwe. No reduction of the ore is yet attempted in the country, but the ore is shipped direct to Europe in its rough state. With the exception of coal, the chrome ore is the only base mineral industry which is being worked at present; but it is hoped that the search for and development of other base minerals on a large scale will not be delayed for long. The chrome output for 1912 amounted to 69,261 tons, valued at £154,600, as against 52,363 tons, of a value of £116,965, or an increase in tonnage of 16,898 tons and value of £37,635. The coal production from the Wankies Colliery marks an increase in tons raised and sold, but, owing to the reduction in price at the pit's mouth, the values show a decrease on the totals of coal sold. This reduction in price has been most welcome to the bigger mines in the country, and coal from this colliery will shortly be sold to mines in Mashonaland, crushing or now in the developing stage, which are far distant from the colliery. The question of fuel is becoming more and more acute in certain districts where mines have been cutting wood for years and they must have coal or cease operations. The railway from Salisbury to Mazoe has brought Wankies coal to the Jumbo Mine, and when the line is completed to the Shamva, coal will be procurable for mining operations at Kimberley Reefs and at the Shamva. Without a steady supply of coal, the latter could not carry out crushing, as, with the large stamping plant they will require, the wood in the locality would soon be exhausted. The broadening of the railway gauge to the Eldorado Mine, now on the eve of being commenced, will allow of Wankies coal being used there as well, and the projected line to the Arcturus Mine will also supply that mine when crushing operations are commenced. So far, the attempts to secure a good class of coal in Mashonaland have not proved successful, but further efforts are being made. Meanwhile the Wankies Colliery, with its better development and system of working, is able to supply coal to the mines which require it, and the railways, and for other purposes.

(To be continued.)

PROGRESS OF THE "T.C.L." OUTSIDE GOLD MINES.

Points from Recent Annual Report.

The following extracts from the annual report reflect the progress of "T.C.L." "outside" ventures:—*Florence and George Claims, District Barberton.*—Prospecting not having disclosed sufficiently encouraging values on the Florence Claims, the option over this block has been abandoned. The option over the fourteen George claims was exercised during the year, the claims being purchased for £1,500, the African Farms, Limited, holding a 25 per cent. interest. The mine is opened up by adit levels, and a quantity of oxidised, semi-oxidised and pyritic ore has been developed and made ready for stoping, as follows:—Oxidised and semi-oxidised, 11,457 tons; value 8.1 dwts. over 68 inches. Pyritic, 3,569 tons; value 7.8 dwts. over 49 inches. The latest extraction tests showed:—Oxidised ore, 90 per cent. extraction; semi oxidised ore, 89 per cent. extraction; pyritic ore, 37 per cent. extraction. By means of roasting, however, the pyritic ore gave an extraction of 83 per cent. Development has been stopped. The question of erecting a mill will be considered. *Mount Morgan Mine.*—Development work was suspended on 31st July, 1912, pending further experiments on the ore developed with a view to obtaining an extraction on a commercial basis. All the levels were driven through the main pay shoot before suspending operations. The pay shoot is still in the floor of the lowest level, showing 5.8 dwts. over 94.3 inches for 170 feet. The total tonnage developed is 20,165 tons, value 8.38 dwts. over 10.3 inches. As this tonnage did not justify the expensive plant necessary under Mr. Pearce's scheme, mentioned in last year's annual report, further experiments were undertaken with a view to finding a method of recovery requiring only a cheap plant, the most successful being a roasting and direct cyaniding of the whole of the ore. But so far, though a fair recovery has been obtained by some of the experiments, the cost of the necessary plant and the probable working costs involved are still too high to be favourably considered.

MINING INTERESTS.

Rietfontein (T.C.L.), Limited.—550 feet of driving, 333 feet of sinking and rising, and 584 feet of intermediate level driving and boxholing have been carried out during the year, making a total development footage of 10,253 feet of driving, sinking, rising, cross-cutting and open cutting to 31st December, 1912. The total tonnage mined has been 5,114 tons. Milling operations commenced in July, 1912, with the following results for the period ended 31st December:—Number of stamps, 2 Nissen stamps and 1 tube mill crushed 4,839 tons, of which 4,609 tons were treated, yielding 1,761,391 ozs. The estimated value of output was £7,333; the estimated value per ton milled, 30s. 3d.; the estimated profit was £681; estimated profit per ton milled was 2s. 10d. Numerous difficulties in connection with the starting of the plant have had to be contended with, but have been gradually overcome. The duty per stamp, which has been abnormally low, has now been brought up to over 25 tons per 24 hours, and it is anticipated that this can be still further increased, while the working costs, which have been abnormally high, have now been greatly reduced. In December, after driving 530 feet south in the second level in almost barren reef, one of the pay shoots already located in the first lever above was struck in this level. Since the end of the year driving has been extended in this shoot, and up to the end of January, 1913, 60 feet had been completed, showing both values and widths greater than the average of the upper levels. A laboratory test on a small quantity of ore from this level showed a percentage of recovery about the same as for ore from the upper levels, and a trial run of the mill on it will be made to prove this in practice. It is hoped that this test will show that the ore from the lower level of the mine may be worked at a profit, notwithstanding the former experiments which indicated its refractory nature. If the result of the test is satisfactory, it will naturally considerably enhance the value of the mine, as up to now only the upper portion of it has been considered capable of profitable exploitation.

FAIRVIEW (T.C.L.).

The development footage at 31st December, 1912, was as follows: Shafts 520 feet, winzes 1,305 feet, levels 2,112 feet, crosscuts 1,055 feet; total, 5,052 feet. A pillar and stall system has been adopted for the stoping of the upper portions of this mine, with satisfactory results. The widths mined have been grater than those originally calculated on, and a re-estimation of the tonnage and ore values is now being undertaken. The erection of the reduction plant was commenced in June, and crushing commenced at the end of October. The plant consisted of one 105 h.p. Premier gas engine and suction gas plant, one 40 h.p. electric generator, one 35 h.p. air compressor, one ore breaker, two 2,000 lbs. Nissen stamps, one 12ft. by 3ft. tube mill, two 24ft. by 19ft. collecting tanks, two Hendryx agitators of 30 tons capacity each, eight solution sumps of 500 tons total capacity, three solution clarifiers, one 20 h.p. electric motor driving agitators, one 10 h.p. motor driving return solution pump, four 12ft. by 3ft. zinc boxes, with necessary buildings, piping, launders, furnaces and assaying equipment. An outfit of workshop tools, consisting of lathe, drilling machine, saw bench, etc., is also provided. The Hendryx agitators were fitted with a set of gravity filter leaves, but owing to the abnormal amount of fine colloidal slime which it was found this ore produced, these filters proved unsatisfactory and were discarded, and the plant was run (still on a mixed pulp of sands and slimes together and crushed in cyanide solution) temporarily with decanters and settling sumps instead of the filters. Owing, however, to the lack of tank capacity under existing conditions, the washing of residues is incomplete, and the tonnage has in the meantime to be restricted to prevent undue loss of gold. A scheme has now been prepared for the more complete recovery of the gold from this ore, and estimates are now in course of preparation. This scheme entails additions in the form of a number of extra tanks and pipe connections, with two pumps and motors and two extra zinc boxes, and will not necessitate any stoppage of the mill. It should be pointed out that the attempt to treat this ore by the agitation of the sands and slimes together in Hendryx agitators and by gravity filtration in the first instance, was justified by the simplicity and economy to be expected from this method. Whilst there was always a doubt as to the success of the filters, it was known that the agitators themselves would in any case fit in with the subsequent decantation plant should the filters not be successful. During the first experimental period of running to the end of November, 980 tons were milled, yielding 375.554 fine ozs., or 7.664 dwts. per ton recovered, showing a profit of £21. During December, 1,070 tons were milled, yielding 469.334 fine ozs., or 8.772 dwts. per ton recovered, showing a profit of £454. The small profits hitherto obtained (and expected pending the completion of the proposed additions to the plant) are entirely due to the restricted tonnage and imperfect recovery of the gold as mentioned above. It is anticipated that the new plant will be running in May, under normal conditions of tonnage and profit, when the latter is expected to amount to £1,500 per month at least. *Butterfly Cecil Group, Rhodesia.*—Development is proceeding on the "Seigneury Block," and the development rock crushed with a light five-stamp mill. With the profit so obtained a small cyanide plant has been erected, the use of which, it is anticipated, will materially assist in increasing the profit.

Kumst Diamonds.

To the Editor, *South African Mining Journal.*

Sir,—Your remarks in your paper re Kumst Diamonds, Ltd., flotation into a new London company of £125,000, with £40,000 working capital, are absolutely ridiculous and uncalled for. Last week when I showed you our mine diamonds you asked me no particular question concerning our property, and had I known you had the slightest doubt about our mine, which you have not seen, I would have sent you out to our manager and asked him to show you our diamond mine, which is proving as we go on with sinking to be of a tremendous size. To my great surprise, I see that you think our new company will have too much working capital. I never expected such a remark from your paper, because you usually preach that "more capital is wanted." It would not have been businesslike on our part to let you know all the "ins and outs" of the matter when we were negotiating with London. You were therefore kept in the dark, and whether I was right or wrong in adopting this course I leave it to others to judge. Thanking you in advance for inserting this letter in your paper.—I am, etc.,

J. O. KUMST,
Managing Director.

Transvaal Bank Building,
Johannesburg, 25th April, 1913.

[The statement to which Mr. Kumst takes exception was: "We are quite in the dark as to the reasons that justify the re-flotation in London, with such a large capital, of a concern that is understood to be still in the unproved syndicate state." The letter printed above throws no additional light upon the subject. We understand that a representative of this paper has been informed on three or four occasions during several months past that arrangements would be made to enable him to inspect the property. We have not yet been informed of any definite arrangement, although our representative has expressed a readiness to go to the property at any time. We have made no reference to the private negotiations with London; our point was, and still is, that we know of no sufficient reason to justify the flotation.—Ed., *S.A.M.J.*]

MINING MEN AND MATTERS.

Mr. J. M. Calderwood, M.I.M.M., is visiting Natal.

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Mr. C. H. Wilkins has severed his connection with Messrs. Fraser & Chalmers.

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Mr. H. H. Webb, chief consulting engineer of the Consolidated Gold Fields of South Africa, has returned from a professional visit to Rhodesia.

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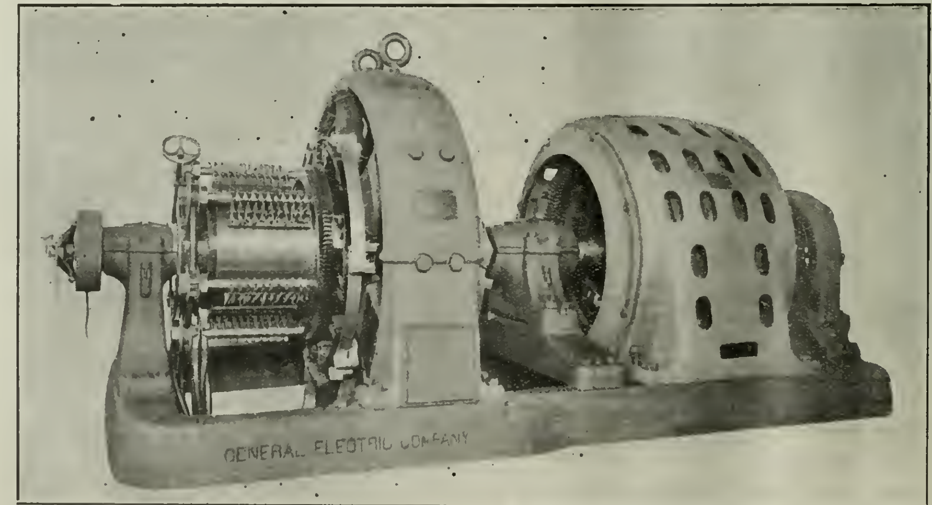
The quarterly meeting of the Association of Certificated (S.A.) Mechanical Engineers will be held in the Langham Hotel (Luthje's) to-night at eight o'clock. Business: Amendments to the new mining regulations.

* * * *

Mr. E. H. Bulman, formerly manager of the Apex Gold Mine, will take over the management of the New Kleinfontein from May 1. Mr. H. C. Whitehead, mine captain at the Apex until the closing down of the mine, will be underground manager of the New Kleinfontein, vice Mr. H. R. Krause. Mr. J. Polgrean, mine captain at New Kleinfontein for many years, has been granted six months' leave of absence.

SOUTH AFRICAN GENERAL ELECTRIC CO.
P.O. BOX 1905. COMMERCIAL EXCHANGE BUILDINGS. TELEPHONE 4321.



Motor Generator Set for Large "Ward Leonard"
ELECTRIC HOIST.

Mining Exhibition—Special Supplement.

Detailed Description of Leading Exhibits.

Below we describe some of the more interesting features of the Mining Exhibition now being held at the Drill Hall. It is not possible to deal with all the exhibits in this issue, and a further instalment will, therefore, appear next week.

New Mining Poles and Pack Systems.

Messrs. Felber, Jucker & Co., Ltd., are exhibiting certain patent mining poles and systems of mine packs which promise to revolutionise our present methods and costs of timbering. They show a composite pole which is only intended to be used for pack or "pig sty" work. Each pole is built up of four laggings or small diameter poles. These are placed together in pairs, and a block of sawn hardwood is placed between, and at each end of the laggings. The height of the pole depends upon the diameter of the laggings and the thickness of the block. It is intended to use 4in. diameter laggings and a hardwood block 4in. thick. This would give a rise of 12in. for each composite pole, which is equal to the rise given in a pack of two 8in. poles or three to four poles of smaller diameter than 8in. The solid poles as now used have to be notched to a depth of 2in., which causes a considerable loss of height. This is unnecessary in these patent pack poles, because the bolts which hold the parts of the composite pole in position protrude about 2in., thus effectively preventing any slipping which otherwise would take place. The cost of an 8ft. composite pack pole giving a rise of 12in. will be about 7s. The cost of two 8ft. by 8in. poles giving the same rise is 11s., plus the labour of notching them. The very great saving in cost is apparent. They also show Dawson's patent pole, for which the firm are sole manufacturers and sellers. The pole is manufactured by means of a patent machine, and the material from which all diameters and lengths of mining poles are made consists of laggings of from 2in. to 4in. diameter. These are squeezed lightly together in the machine, and bound tightly with strong hoop iron, thus forming a pole the diameter of which depends upon the number of laggings used and size of same. Another form of pole is shown consisting of four stout laggings diagonally bolted together, thus forming a kind of cruciform stanchion. Again the size of pole depends upon the sizes of laggings used. Thus four 8ft. by 4in. laggings bolted together form an 8ft. by 8in. pole. It is claimed for the above two kinds of poles that they are much lighter to handle down the mine and are quite as strong and much straighter than the solid poles, and above all are from 15 to 25 per cent. cheaper.

Georges Pressure Wedge Chocks.

These chocks put a pressure against the hanging wall, which is quite a distinct feature from the hanging wall putting a pressure on the chocks, thus preventing weak parts of the said wall from breaking away from the main body, as it always does with ordinary chocks. It is more economical and efficient to use pressure chocks than to leave natural pillars (especially in deep mining). These chocks gradually give way against a great pressure; natural pillars on the other hand either penetrate the hanging or foot wall and cause fractures and wind blasts which would be impossible with pressure chocks well distributed, besides which no valuable ore would be lost.

Improved Hardwood Railway and Tram Track Sleepers.

By using these sleepers much labour is saved in laying tram tracks, as they contain the combined advantages of the ordinary wooden and steel sleeper. It is impossible for the track to get out of gauge, and the rails always remain firm because of the rail being embedded in the sleeper as well as being either bolted or spiked to same.

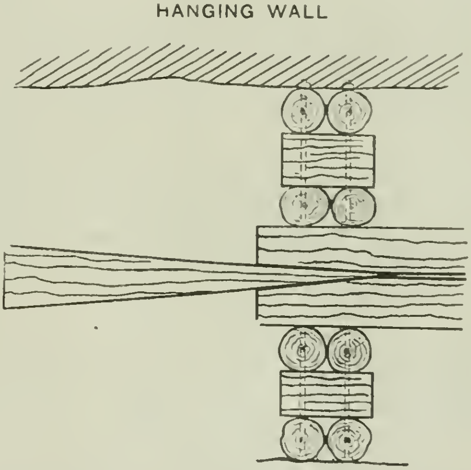


Diagram shows corner section of a pack composed of patent composite pack poles and Georges patent pressure wedges for tightening the pack to the hanging wall.

Hubert Davies & Co.

This exhibit is arranged to display the wide range of machinery and electrical and mechanical mining supplies handled by this firm, the heavier classes of machinery being illustrated by photographs, while samples are shown of interesting mining requisites. Prominent on this stand is a specially designed switch panel manufactured by Messrs. Eckstein, Heap & Co., made in sizes suitable for controlling high tension motors up to 500 h.p. This switch panel demands attention for its robust design and easy accessibility to the working parts. An interesting range of recording electrical instruments manufactured by Messrs. Elliott Bros. is also a prominent feature of this exhibit. Messrs. Elliott Bros. have a very high reputation for the construction of high-class electrical testing instruments, and the exhibits on this stand will give some idea of what this firm's manufactures are. Messrs. Pinchin & Johnson's varnishes for all classes of electrical work have only lately been introduced in this country, but have proved themselves most satisfactory for armature and field coils of direct current machines and rotor and stator insulation of A.C. motors and generators. The importance of the quality of the varnish used in this class of work is a great factor in maintaining all kinds of electrical plant in a high state of efficiency. The following are some of the principal insulating varnishes made by this company: Voltalac, an air drying black varnish, plastic and waterproof. Endolac, a high grade quick drying finishing varnish supplied either in black or golden finish. The firm also supply Hudaco solution, a superior elastic drying black coating for iron, steel and zinc to prevent corrosion, used for coating smoke stacks and iron work requiring protection above and below ground. Novento, a new composition for treating brickwork settings of boilers to check porosity; also Silveroid, an extra brilliant aluminium paint which does not turn black.

The firm also show a large selection of high and low tension insulators, accumulators and dry cells for bell work and other accessories suitable for electrical installation on a mine. The samples of the production of the Morgan Crucible Co., in the form of motor and slip ring brushes, is very interesting. The different qualities of morganite varying from a large percentage of copper to pure graphite is shown and also a range of the very high-class carbon brushes.

On the mechanical side an interesting display of pulley blocks manufactured by Messrs. Herbert Morris, Ltd. (late Herbert Morris & Bastert, Ltd.), is shown. The sound construction and excellent workmanship displayed in the manufacture of these blocks is worthy of note. We are informed by Messrs. Hubert Davies & Co. that the high efficiency of the lifting tackle supplied by this firm has caused their wide adoption on many mines of the Witwatersrand. In connection with the manufactures of this firm, Messrs. Hubert Davies & Co. show a photograph of the 50-ton electric crane supplied to the East Rand Proprietary Mines, being one of a number of large electric cranes they have in work on various mines in Africa. Messrs. Herbert Morris, Ltd., have long been known as very large manufacturers of pulley blocks and lifting gear, but this photograph is interesting as illustrating the heavier class of cranes which they supply. The name of Hans Renolds, Ltd., is a household word in connection with driving chains, and therefore it is natural that their productions should be in evidence at an exhibition of this character. On this stand is therefore shown a selection of driving chains and wheels. In view of the extensive application of this form of drive this exhibit is of considerable interest. A case of samples of wires rope, illustrating the productions of Messrs. D. H. & G. Haggie, the well-known firm of wire rope makers in Sunderland, is shown. In connection with this, particular attention is drawn to Messrs. D. H. & G. Haggie's special type of flattened strand and lock coil ropes. A striking feature of the stand is a handsome show case containing samples of drill steel of various sizes, the whole being the production of Messrs. Steel, Peech & Tozer, Ltd., of Sheffield. Messrs. Steel, Peech & Tozer, Ltd., are very large manufacturers of railway material and all classes of high-grade steel. It is a pity that the range of this exhibit does not permit of the display of heavy machinery, but Messrs. Hubert Davies & Co. have to some extent surmounted this difficulty by the selection of photographs they show which gives some idea of the large installations carried out by this firm. Prominent among these is a photograph of the 6,000 k.w. turbo-alternator supplied by this firm to the East Rand Proprietary Mines, the turbine being manufactured by Messrs. Willans & Robinson, of Rugby, and the generator by Messrs. Dick, Kerr & Co. Photographs are shown illustrating the well-known high speed steam engines manufactured by Messrs. Browett, Lindley & Co., similar to two recently supplied to the Messina Development Co. Messrs. Hubert Davies & Co. recently obtained a large contract from the Worcester Exploration and Gold Mining Co. for the alteration of their plant, and in this connection show photographs of Messrs. Gilbert Gilkes & Co.'s water turbines, as just lately supplied to the Worcester mine. A photograph of a Tilghman high speed air compressor similar to one also supplied to this property is also there. An interesting photograph is one depicting a high lift turbo pump manufactured by Messrs. Escher, Wyss & Co., of Zurich. This photograph is one of eight pumps now being supplied to the East Rand Proprietary Mines. The pumps are designed for a duty of 60,000 gallons of water per hour against a head of 1,150 feet. Photographs are also shown of gas and oil engines manufactured by Messrs. Richard Hornsby & Sons, Ltd., a very large number of which have been supplied in various outlying districts in South Africa. Altogether this exhibit goes far to illustrate the wide range of business handled by Messrs. Hubert Davies & Co. In view of its character it is impossible to indicate in detail all the features of an exhibit such as this, since in addition to the various articles we have described there are numerous other ones presenting features which make them worthy of the careful attention of anyone visiting the exhibition. This is certainly a stand which will repay the careful study of any engineer.

South African General Electric Co.

A noteworthy exhibit is that of the South African General Electric Company, who have recently added a mechanical engineering department to their business. They show a variety of very interesting articles, and we were specially attracted by the "Sturtevant" laboratory machinery. The crusher shown is of very heavy construction (weight about 700 lbs.), and should therefore prove of eminent use to Rand laboratories. This machine appears to be a great improvement on most of the ordinary types, and its construction allows of an easy opening of the machine for cleaning purposes. The jaw plates are of best manganese steel, and spare plates are supplied with each machine. The grinder also seems of an approved design and very rigidly built. The stationary disc is so arranged that it can be moved frequently from its centre, thus changing the relative positions of the two grinding surfaces, so that all cuts, scores or rings made in the faces may grind themselves out. Fine and even grinding is thus assured. A spare set of manganese steel grinding discs is supplied with this machine. The machine can be cleaned with easy and rapidity: not even a bolt is removed to give full access to the interior. We also noted with great interest the samples of Ferrum pipe joints, which we understand are only some representatives of a wide range of patent joints of the Ferrum Company, who are recognised as being one of the largest pipe manufacturers in the world. The sketch map of the world, which can also be seen at this stand, confirms this statement, as it shows some of the principal water mains for installations all over the world manufactured by this firm. They have now in hand extensive orders for air and water mains for the Rand. We were given to understand that the South African General Electric Company intended to exhibit a new design of turbo pump, but unfortunately this did not arrive in time. The stand, however, is well filled with other goods of interest. The wide range of Hellesens dry cells is very attractive, and the neat finish of the hand lamps exhibited, which are all fitted with these cells, shows the ever-increasing success of the manufacturers, who continually improve even on the best of articles. We have seen these lamps burning for a whole day incessantly without showing the slightest fall off in the brilliancy of the light. There is a show case of aluminium which requires particular attention. The use of this metal is continually increasing, especially in the electrical industry, and we would advise every visitor who is interested in electric power transmission to help himself to one of the pamphlets on aluminium, which the South African General Electric Company have put there for this purpose. It is, of course, difficult for any exhibitor to show all that might be of interest to visitors, as the space is limited only. The South African General Electric Company have attempted to exhibit those of their goods which are either new or show some improvement on similar goods handled by them before. A visit to their spacious show rooms at Commercial Exchange Buildings will probably be of great interest to every mining engineer, who will find articles there which, owing to the limited space available at the exhibition, could not be put up in the Drill Hall. We would also draw the attention of the public to the 1,000 candle-power "Mazda" lamp, which illumines the stand of the South African General Electric Company, and which represents the height of perfection in drawn wire metallic filament lamps.

Orenstein-Arthur Koppel, Ltd.

The firm of Orenstein-Arthur Koppel, Ltd., are exhibiting photos, instruments, machinery, etc., of the manufacture of the sole agencies they are holding for South Africa.

MANNESMANN TUBE WORKS.

Mannesmann solid drawn steel piping. No. 1 represents the normal joint of the well-known Mannesmann weldless solid drawn spigot and faucet piping for water and air mains, in all sizes from 1½in. to 10in. inside diameter; special features of these joints are the long packing spaces and the specially strengthened faucet end thickened from the solid, which allows the lead and hemp properly to be driven home without danger of splitting the sockets during the operation of caulking, thus ensuring a perfect joint. Other features of this piping are their long lengths up to 40 feet in one piece and the high-class steel used for its manufacture. The pipes are coated both sides with Mannesmann asphalte solution, and are supplied for soils containing acids and salts, with jute cover. No. 2 represents a high-pressure spigot and faucet and flanged joints for water and compressed air. This joint has been supplied for many high-pressure mains up to 900 lbs. water pressure. No. 3 is the famous Mannesmann double border joint for high-pressure mains, as pump columns, which have withstood tests up to a pressure of 15,000 lbs. per square inch. Nos. 4, 5, 6, 7, 8, represent various joints of Mannesmann solid drawn boring and lining press for deep boring and deep wells. Depths up to 5,800 feet have been reached by employing this class of piping.

MESSRS. POKORNY & WITTEKIND.

This firm are specialists in compressors and pneumatic tools. They manufacture the reciprocating compressors with the famous "Koester Valve Gear." Details of this Koester valve gear as well as of the construction of the reciprocating compressor are given on the sectional drawings exhibited, and many compressors are supplied by this firm to mines on the Rand. Special attention is drawn to the three 75-drill steam driven compressors supplied to the Brakpan Mines by this firm. Another feature of this firm's manufacture is their improve turbo compressor, several photos of which are exhibited. The above-mentioned firm has supplied one large turbo compressor coupled direct to three-phase motors to the Victoria Falls and Transvaal Power Co., Robinson Central Deep station. Capacity of this compressor is 21,500 cubic feet per minute (4,000 h.p.). This firm is also supplying and erecting an electrically driven turbo compressor for the Randfontein Estates, capacity of same is 12,000 cubic feet per minute. Further, the following steam driven compressors:—9,000 cubic feet per minutes, Van Ryn Deep; 15,000 cubic feet per minute, Brakpan Mines; 5,000 cubic feet per minute, Shamva Mines. Messrs. Pokorny & Wittekind also specialise in steam business for live, exhaust and mixed steam, and they are erecting at present an exhaust steam turbo generating set at the Geduld Proprietary Mines.

MESSRS. SULZER BROS.

Exhibits include: One 8-stage high lift centrifugal pump running at 3,000 r.p.m. when pumping 150 gallons per minute against a lift of 800 feet. This pump has been presented by the makers to the S.A. School of Mines, and the necessary appliances have been supplied with same in order to run the pump at heads varying from 100 to 800 feet. The Sulzer 2-stage centrifugal pump, which is of very simple design, is also exhibited. This type of pump has been applied for different purposes, especially for gland water service on sand and slimes pumps. It might be mentioned here that this pump is taken from Johannesburg stock, and that Messrs. O. A. K., Ltd., always keep a large stock of different types and sizes of Sulzer pumps in Johannesburg stock. Special attention is drawn to the photo showing the high lift pumping plant in No. 5 shaft of the Crown Mines, Ltd. This plant is installed at the 13th level, and each set is capable of delivering 375 gallons per minute against a total head of about 2,200 feet. Two similar pump sets are just in the course of erection at the Durban Roodepoort Deep G.M., but these pumps will have to lift the water against the total head of 2,600 feet. Another photo exhibited shows two 600 B.H.P. uniflow steam engines direct coupled to electric generators, as manufactured by Messrs. Sulzer Bros., and supplied to Messrs. Vivian & Son, Swansea. The uniflow steam engine represents the latest features in steam engine design. In this single cylinder engine the utmost simplicity is combined with the greatest economy. The moving parts are reduced to a minimum, and the steam consumption of same is similar if not better than that of the triple expansion engines under the same conditions. There are also two photos of Sulzer Diesel engines exhibited, one of the totally enclosed forced lubricated type of 400 B.H.P. capacity and a 1,000 B.H.P. engine of Messrs. Sulzer's patent two-cycle design.

MONTANIA ENGINEERING WORKS.

Messrs. O.-A. K., Ltd., exhibited a photo showing the Montania 25 B.H.P. petrol locos. This photo was taken on the 1st level of the Crown Mines Langlaagte Deep section.

MAX. HILDEBRAND, FREIBERG.

Theodolites for mining purposes as well as for land surveying are exhibited. These theodolites are made by the world-renowned firm, Max. Hildebrand, Freiberg, and the excellency of their manufacture has been proved by the record surveying of the Brakpan Mines a few years ago when linking up the two shafts.

WESTFALIA ENGINEERING WORKS.

The Shamrock rescue reviving apparata, etc., as manufactured by the above firm, are exhibited, and it might be mentioned that these apparata are practically the most modern instruments for rescue work. The stretcher with oxygen equipment will be of special interest. Mining men interested in these apparata would be well advised to ask Messrs. O.-A. K., Ltd., to demonstrate same to them in order to fully explain how the different apparata act.

PURSER'S PATENT COCK.

This is a local invention, and the cock, as already used by several mines on the Rand, is invented in order to save compressed air. The cock is of a very simple design and is most effective. Full information and demonstration of the action of the cock will be given on application.

The C.G.S. Patent Detachable Bit.

MANY ADVANTAGES CLAIMED.

This exhibit consists of sets of bits and shanks for 3¼ machine drills, made under a patent taken out by Messrs. Clayden, Glendening & Stevens. The patentees claim it is the most perfect detachable bit yet produced, the principle involved being as follows: The bit is drawn home tight on the face of the drill shank by a tit on the end of the shank of the bit mounting upon a helical path formed at the bottom of a bushing fixed in the drill shank. The concussion of the blow is taken direct on to the drill shank by two parallel faces. The bit does not depend in any way on the taper of the shank holding it in position, and as the machine rotates in drilling is drawn tight down on the face of the drill shank. One set of bits exhibited have drilled a 7 feet hole, and a starting bit, which has completed two holes, together with section of the rock obtained after blast, is on exhibition, showing the perfectly clean hole drilled by this bit. The inventors claim that 20 per cent. can be saved in the drilling time by the use of this bit as compared with ordinary machine drills. This, we understand, is due to the rush of air past the small length of the head of the bit, which keeps the face of the hole perfectly clean, and on the back stroke of the machine the edge of the bit, projecting slightly beyond the shank, also helps to scrape the hole clean and keep it to size. The weight of the set of four bits is 2¼ lbs; therefore, on any mine adopting this bit, each miner would only have to carry 10 lbs. of steel from the shaft collar to his working face, and the immense cost of drill transportation and maintenance of steel would be saved. We understand that trials of this bit are now being conducted on several mines with highly satisfactory results. The selling agent for the patent is Mr. C. F. Wienand, Box 1352, from whom all information can be obtained.

A Useful Invention.

Among the exhibits at the Mining Exhibition, what would pass unnoticed probably with most people is a useful invention in the shape of a box for tying up tickets in a time office. The apparatus consists of a long narrow box, in which the tickets stand on their ends. There is no top to the box, and one side is missing, but their place is taken by a separate piece which can form the side of the box when tickets are being tied across their tops, or the top when they are being tied across their sides, the fixed side piece being slotted from end to end for the purpose of inserting a piece of twine for the second fastening. Inside the box is a false sliding end piece connected to a projecting handle or guide which runs along a slot in the bottom of the box. This slide is pulled towards the operator to compress the tickets, and is fixed in this position by a peg inserted in one of the holes in the handle, thus allowing of both hands being free for the tying of the tickets the first time. The box is in use in the Sub Nigel time office, and it is so very simple in its construction and working that the inventor hesitated to go to the expense of patenting and exhibiting it, until assured it was worth it by some friends who had been timekeepers in their time and are now in higher positions. Even without any such explanation as this, it only remains to be said that the inventor is Mr. G. W. Tait, author of "Gold Mine Accounts and Costing," which originally appeared in these columns. His experience in matters of this nature should vouch for the necessity and usefulness of the apparatus. In most time offices, expensive cabinets are provided for stowing away tickets for the period required by the company's auditors. If tickets are put up in parcels by means of this box, they are always available for reference when required, and when they have to be destroyed it is the easiest thing in the world to get hold of the particular parcel required and put it into the fire.

Northern Transvaal Mica.

A very interesting exhibit at the Mining Exhibition is that of samples of mica from the Northern Transvaal, shown by Mr. C. Treadwell. Very large deposits of this valuable mineral are known to occur on ground situated in the Leydsdorp district and owned by a few syndicates, and the quality has been pronounced equal to that produced in India and the Brazils. Hitherto the development of these fields has been retarded owing to difficult country and total absence of transport. With the advent of the extension of the Selati Railway, however, a new era of prosperity is opening up for the district, and already we hear a movement is on foot for the amalgamation of certain interests in mica in that district, and the provision of sufficient capital to open up and develop these fields of untouched wealth. We wish those interested every success in their endeavour to start a new industry in that district of great potentialities.

Siskol Specialities.

One of the most interesting machines exhibited under the now well-known trade mark "Siskol" is a coal-cutter mounted on a special carriage for "flitting" the machine intact from one bord to another. A large order for machines fitted with this carriage has just been placed by an important colliery in the Transvaal at the conclusion of a three months' test against another type of coal cutter. The "Siskol" coal cutter is also shown in position for cutting at various heights in the coal seam, and a machine is also rigged for shearing in places where speed of driving is important. Several new sizes of the "Siskol" stope drill are also on exhibition, including a larger size of the type that won the £2,500 first prize in the 1909-10 Stope Drill Competition. A further important improvement has been embodied in this machine, by which the wearing capacity of the valve has been more than doubled. The "Siskol" quick-rigging reversible ratchet bar is well worth inspection, and in actual work it has proved itself to be all that is claimed for it. The new type "Siskoll" hammer drills embody many improvements and special features. A number of these machines have now been working on the Reef for nearly a year, and the reports of them are most satisfactory. On the "Siskol" stand is also to be seen the "Ceag" electric safety lamp, which was awarded the first prize of £600 by the British Government, after exhaustive tests

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made to ascertain the respective merits of electric safety lamps. It may be mentioned that the lamp which was placed second was only awarded a prize of £50. All the machines exhibited on this stand are noteworthy for the novel and exclusive features which they possess, and the continued success of "Siskol" machines all over the world is sufficient guarantee of the excellence of their manufacture.

Ward's Improved Fastener (Protected).

A model of the above is shown, accompanied by drawing, showing work necessary to convert shaft and pulley to this drive. It is adaptable to any size of shafting, and is especially suitable for cam shaft pulleys, cams, or the like, where heavy weights and vibration have to be contended with. Pulley and fastener can be run on either right or left hand shaft. It embodies the advantages of the new well known fasteners, without any of their disadvantages, and is distinctly an improvement on anything yet on the market for this purpose. It is simplicity itself, and has evidently been invented by a practical man, who knows what is required for the successful running of the heavy stamps erected on these fields.

Messrs. H. Incledon & Co., Ltd.

Messrs. H. Incledon and Co., Ltd., importers and manufacturers of piping, fittings, valves, etc., for all classes of water, gas, steam, compressed air, and other installations, have a stand filled with their patent "Shovel" valves for cyanide plants, and for general town and sewage work, where the material dealt with is likely to choke the valve. They also exhibit some very fine valves made by Messrs. Blakeborough and Sons, the well-known hydraulic engineers (for whom Messrs. Incledon and Co. are sole agents), and some illustrations and model of patent tank plates as made by Messrs. Piggott and Co., of Birmingham. The tank plates are made of substantial thickness (5 16in.), and are ribbed to strengthen them. The plates are made in units of 4ft. square, and therefore any size of tank can be built up as required. An important feature in the exhibit is the show of cast steel valves, which are capable of withstanding the heavy pressure of 1,300 lbs. working pressure per square inch, which is the equivalent of over 3,000 feet lift for a single pumping outfit, now being commonly supplied to the various deep level mines. One of the features which stand out very markedly on this stand is the huge ball valve of the equilibrium type. Two types of valves are shown which are fitted with seats that can be replaced when required without taking the valve from its place on the pipe lines. The Spenhow valve has a small seat of special composition which will withstand the highest temperatures of superheated steam, and while the price is not excessive the design of the valve is substantial. The Dikker valve is a new departure from the sunk type of reseating valve, and its construction admits of the whole of the seat and its packing being removed for replacement if required. Messrs H. Incledon and Co., Ltd., of Birmingham, Johannesburg and Durban have a huge stock of piping at their stores and workshops, situated at Albert Street in the City and Suburban Township, etc., and we are informed that all their material is screwed to the established English or American (Briggs) threads, which have been adopted on the various mines, and by the various Municipalities throughout South Africa. This firm has supplied cyanide plant, valves, etc., to the large mines in all parts of South Africa, and at the present has contracts with the Van Ryn Deep, De Beers, and other important corporations, for specially designed and constructed plant for importation, and from stock supplied from their local workshops. Large supplies are also kept at Durban to meet the requirements of the great Natal colliery and other industries. The show on the stand is only typical of the stock kept, and a visit to the various stores and workshops of this company will indicate the very large amount of capital sunk in keeping up the stock required by mining and other corporations in South Africa.

Rooiberg Minerals Development Co.

The report of the Rooiberg Minerals Development Co. for the quarter ended 31st March, 1913, states the net profit was £23,089 13s. 7d. Number of stamps running, 10; number of days, 86·10; tons treated—crushed from mine, 5,556 tons; sands and slimes re-treated, 3,452 tons; total, 9,008 tons; tons of concentrates produced, 305 long tons; concentrates in reserve at end of quarter, 17·33 long tons; net value, £1,616; accumulated tonnage middlings and slimes not re-treated at end of quarter, 33,601 short tons; average assay value, 2·49 per cent. M.T.; capital expenditure for the quarter, £1,851 12s. 1d. Payable values have been met with on the pyritic lode, 310 ft. level drive east off Union north, and on the Union lode drive north, 310 ft. level, the ore occurring in lenticular form. High-grade ore has been exposed in No. 3 winze on the Progress lode, 110 ft. level, and in the cross-course west off "H" lode north, between the Bond and pyritic lodes, 63 ft. level. At the east end old workings, a series of pockets of high-grade ore have been exposed on a cross-course west off the Empire lode, north of the dyke, and a connection effected with the old No. 5 shaft workings. Exploration and prospecting has been vigorously pursued, and many encouraging indications have been located. Prominent amongst these is the discovery of a pocket of excellent ore on what appears to be the far southern extension of the Union lode, some 250 yards south of the European hospital site. Good prospects have also been encountered at the intermediate workings, whilst at the Camp shaft and No. 15 trench, open workings high-grade ore has been mined from the various fissures, which are being followed up. In the north-west corner of Olievenbosch South a prospecting shaft has been sunk to a depth of 50 ft. in the area of ancient workings, and a cross-cut south-west is now being put in to intersect a fissure from which a pocket of good ore was obtained near the surface.

Patents,

In the Assembly this week, Dr. MacNeillie (Boksburg) asked the Minister of Justice: (1) Whether patents still required registration; and (2) if so, whether he would at an early date introduce a patents' law applicable to the whole Union. The Minister of Justice replied in the affirmative to (1), and, in regard to (2), said it was his intention to introduce a consolidating patents' law for the Union next session.

Roberts Victor.

Owing to heavy rains, the manager has temporarily ceased washing—preparatory, on resumption of washing, to treating a larger quantity.

Lydenburg Farms.

In his speech at the annual meeting of the Lydenburg Gold Farms, Ltd., the Chairman said the reduced capital consisted to-day of a first item of £10,016 14s. 4d., represented by a property account. That consisted of eighteen freehold farms and mineral rights on one freehold farm. This amount of £40,016, in the opinion of the directors, represented what might be taken as the value of the land and property—what they would fetch to-day. In addition they had buildings, furniture and fittings, plant, interest in suspense, sundry debtors and investments, consisting of Rand Club debentures. There was also £11,070 5s. 6d. cash in hand, some of which was required to pay the balance of the distribution of 6s. 8d. in the £. They hoped in the course of time to be able to realise the land and property, and he thought they could look forward to the farm Vlakfontein, at any rate, turning out a very valuable asset in view of the recent developments on the East Rand. In any case, where they sold their farms they reserved mineral rights, so that should minerals be found, the company would benefit.

ANSWERS TO CORRESPONDENTS.

"Benoni."—A supplement is being prepared on the lines indicated by you, with full illustrations. It will deal with gold and coal properties as well as the townships you mention.

"London Reader."—There is no map issued, but in a supplement in course of preparation we intend to publish a small map which will embrace the Modderfontein properties.

"Shareholder."—Held for space.

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Engineering Notes and News.

POWER SUPPLY ON THE RAND.*

[By A. E. Hadley.]

The Victoria Falls and Transvaal Power Company, Limited, was formed at the end of 1906 with the object of supplying power in South Africa and Rhodesia, and of acquiring the concessional rights to develop the Victoria Falls. Under the original proposal a supply to the Rand was to be given partly by transmitting power from the Victoria Falls, 700 miles distant, and partly by steam-generating stations located on the reef. The author became associated with the company shortly after its formation, and after its original proposal had been modified through giving up the plan to supply part of the requirements of the Rand with power from the Falls. The increase in the coal supplies in the Transvaal bringing about a reduction in the price of local fuel, the necessity for starting operations without any delay, and the objections raised by various vested interests to the importation of power from outside the Colony, were among the principal reasons for delaying the development of the Falls until the population of Rhodesia increases or until the demand in South Africa for manufacturing sites with cheap electric power available justifies the expenditure. It was therefore decided to supply the Witwatersrand from steam plant using local fuel. The great demand for power on the Witwatersrand has arisen through the extraordinarily successful development of the gold mines on the reef, which, although only discovered in 1886, now produce 33 per cent. of the world's output of gold. Further, it is estimated by the leaders of the gold mining industry that the work of raising gold will be in progress on the Rand one hundred years hence. Turning for a moment to the history of electric power on the Rand, a few details will be of interest. Siemens and Halske were the first to obtain a concession in 1894, and formed the Rand Central Electric Works, Ltd., in 1895, which had a plant aggregating 3,200 kw. capacity in 1906. Another concession was obtained by the Simmer and Jack mine in 1897, from which the General Electric Power Company was established in 1906 with plant having a capacity of 2,500 kw. In 1905 Messrs. Lewis and Marks, having in view the possibility of supplying the Rand from their coalfields at Vereeniging, 35 miles south, commenced obtaining wayleaves for a pole line, while certain European manufacturing companies sent out representatives to report on the prospects. The Victoria Falls Company ultimately took over the two existing supply companies in 1907, and purchased the Vereeniging wayleaves from Messrs. Lewis and Marks, at the same time entering into an agreement with them for the right to establish a power station at Vereeniging. In 1907, pending the installation of modern plant, a supply totalling 4,000 kw. was given from the existing steam stations which had been purchased. As soon as it was appreciated that a cheap power supply was available the mining groups entered into contracts with the company, and the demands for power have since increased so quickly that it has throughout been the greatest difficulty for the company to raise capital and instal plant rapidly enough to satisfy the demand. In 1908 the largest group of mines, viz., that controlled by the Rand Mines, Ltd., and Messrs. Eckstein and Co., decided to change over their mines to electric driving. In addition to the supply of electricity to this group of mines, the conditions called for the supply of compressed air for working the rock drills. These mines agreed to purchase the whole of their power requirements and to shut down all their existing boiler plant, whereas the other groups are not bound in this way, but have contracted to take electricity from no other power company, and to continue to take any supply required by them exclusively from the power company. There was a further stipulation in the case of the Rand Mines group that the supply should be given by a company to be formed for the purpose and registered in the Transvaal. This led to the registration of the Rand Mines Power Supply Co., Ltd.; the entire capital of which has been provided by the Victoria Falls Power Company. The two undertakings are working under separate licences granted by the Government in terms of a Power Act passed in 1910, but are operated by the same management and staff. The supply is furnished to all mining consumers at 2,100 volts and 525 volts. The necessary step-down transformers and switchgear are provided by the power company, while the consumer supplies the sub-station building and pays the power company a sum equal to 2 per cent. of the power bill to cover the losses in the step-down transformers. The standard price in mining contracts covering not less than twelve years is 0.525d. per unit, as long as the monthly load factor is above 70 per cent., the load factor being based on the hour of maximum consumption. This price is subject to periodical revision depending upon the cost of production, and further, a participation with the consumers in the profits of the business after a due return has been paid on capital is also provided for. In case of failure of supply, the consumers are entitled to a payment from the power company of seven shillings per hour for each 100 kw. put out of commission. The introduction of these prices on the Rand has reduced the cost of power to the mines by 40 per cent., and has reduced the cost of production of gold by an amount varying from sixpence to a shilling per ton of ore milled. It has further resulted in considerable saving of capital expenditure on plant, which in the case of a new mine may amount to £100,000. The area over which a power supply had to be given lies within a strip about two miles broad and stretching fifty miles from east to west. The total power used by the mines at the present time is estimated at about 400,000 h.p. The town of Johannesburg, which has its own electric plant, is situated about the middle of this strip, while the town of Germiston, about nine miles to the east, is supplied by the company.

POWER STATIONS.

The initial power stations were laid out in order to allow of considerable extension, as the immediate future demand could not be accurately estimated. The local water supply conditions restricted the choice of the station sites to certain artificial lakes situated along the reef and to the Vaal River, which runs parallel to the reef and is 35 miles south. Power plants aggregating nearly 180,000 kw. have been installed in, or are under construction for, the stations enumerated in the following table. They are set out in the order in which they were built :—

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* Extracts from a paper read before the Institution of Electrical Engineers.

Name of Station.	Total capacity of Electric Generating Plant installed.	Steam-driven Air Compressors installed.	Extensions in progress
Brakpan	Two 3,000-kw. sets	—	—
Simmerpan	Six 3,000-kw. sets	—	—
Rosherville	Five 10,000-kw. sets	Six 3,500-kw. machines	Three 7,000-kw. steam-driven air compressors.
Vereeniging	Four 10,000 kw. sets	—	—
Extensions in 1913 ..	—	—	Two 10,000-kw. sets
	114,000-kw.	21,000-kw.	41,000-kw.
Total capacity of plant installed and in progress		176,000-kw.	

At Robinson Central air station there are also six electrically-driven air compressors each of 3,500 kw. capacity. At all stations steam turbo-electric generating sets are employed, and produce three-phase energy at 50 cycles. Step-up transformers raise the generator pressure to 40,000, 20,000, or 10,000 volts, and their interposition gives additional security to the machines against pressure rises. This method, in which the generator voltage is optional, gives the further advantage of enabling the stators to be constructed with bar winding having one bar per slot. There is a general resemblance in the lay-out of all these stations, modifications being introduced to suit varying local conditions. A description of the largest plant, that at the Rosherville Dam, is given later as being representative of the general design.

ELECTRICAL TRANSMISSION SYSTEM.

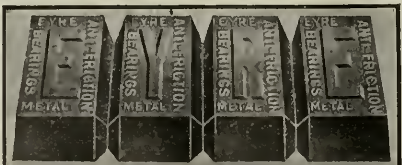
The main system of transmission is effected by means of 40,000-volt overhead lines stretching practically the whole length of the reef. At the present time, however, the western extremity is working as a 20,000-volt distribution line. Where the load is most dense the transmission system consists of two rows of towers each arranged to carry two circuits. The 40,000-volt transmission system is fed at four points, namely, at Brakpan, Simmer Pan, Rosherville, and at Robinson Central, where the supply from the Vereeniging stations joins the reef. In addition to these distribution stations, the transmission lines pass through two further distributing centres at Hercules to the east and Bantjes to the west. From these six points distribution networks, laid out as ring mains, supply the various sub-stations on the mines. The three eastern distribution stations supply the system through 10,000 volt overhead lines. The central portion of the area is served by an underground 20,000-volt cable system, and the western distribution net work, as previously mentioned, is working at 20,000 volts by overhead lines. The Vereeniging station is connected to the Rand by an 80,000-volt line approximately 35 miles long, terminating at the Robinson Central distribution station, where the pressure is transformed to either 40,000 or 20,000 volts, these pressures being also coupled together through transformers aggregating 16,000 k.v.a.

80,000-volt Pole Line.—This line consists of two rows of lattice steel masts equipped with four circuits of stranded copper, each conductor having a section of 60 sq. mm. and carrying three earthed guard wires above the conductors. Every fourth mast (commonly called an "anchor mast") is of sufficient strength to take the full strain of the conductors in a lateral direction; and the three intermediate masts are designed to take the strain due to wind pressure in a direction transverse to the line. Extra anchor masts are also used whenever the line changes its direction, and at railway crossings. A special end tower is used at the ends of the line. The masts are normally spaced 500 feet apart. The anchor masts have an overall height of 71 ft. 6 in., the lowest cross-arm being 34 ft. 6 in. from the ground. On these masts the conductors are placed vertically above each other, and are separated by a distance of 9 feet. Each mast was required to deflect $\frac{1}{8}$in. at the top when subjected to a horizontal pull of $4\frac{1}{4}$ tons applied 44 feet from the ground at an angle of 30 degrees from the line direction. The intermediate masts, when carrying the weight of the insulators, conductors, and guard wires, were required to give a temporary deflection at the top of 11-16in. when subject to a horizontal pull of 35 cwt., applied 35 feet from the ground and at right angles to the line direction. The conductors on these masts are arranged three on each side, in the shape of an equilateral triangle having sides 8ft. long. The lowest support for the conductors is 34ft. 6in. from the ground, and a 10ft. sag is allowed, so that the lowest part of any conductor is never less than 24ft. 6in. from the ground. All masts are provided with a safety screen to prevent any possibility of men working on one circuit coming into contact with the circuit on the opposite side of the pole. This screen consists of a rectangular steel framework interlaced with galvanised steel wire-netting. The 80,000-volt insulators used are of the disc type, 10in. in diameter, and connected six in series at each suspension and straining point. Before each erection each insulator is subjected to a mechanical stress of $1\frac{1}{4}$ tons, and while in this condition is tested to 60,000 volts for five minutes. The latest type of 40,000-volt transmission line is of a similar design, but pin insulators are employed on the intermediate lattice masts, and four discs are used in each string of insulators on the main towers which take the lateral strain. All the 20,000-volt cables have circulated conductors of 100 sq. mm. section, and are paper-insulated, lead-covered, and armoured. Each cable is capable of transmitting about 7,000 k.v.a. The cable was specified to stand a test pressure at the factory of 50,000 volts, and a test pressure of 40,000 volts for ten minutes after laying. The system has been laid out so as to be operated during the development of the undertaking as a single system, but arranged that when the growth of the load made it desirable (both from the point of view of economy and also of safety of supply) it could be sectionalised without the necessity of running additional machinery.

PROTECTION FROM ATMOSPHERIC DISTURBANCES.

The means whereby the effects of lightning have been prevented in the great majority of cases from disturbing the system are mainly: (*a*) the employment of earthed overhead guard wires; (*b*) earthing the neutral of each separate section of the system; and (*c*) by careful selection and adjustment of lightning arresters to deal with the different conditions arising. When the supply was first started four years ago a considerable amount of overhead transmission line which was not provided with guard wires was taken over from the old company, and the neutral of the system was also not earthed. Little accurate information then existed regarding lightning arresters, consequently many interruptions of the service occurred, and apparatus was frequently damaged. In analysing the effects of any lightning disturbances, it has proved difficult to trace definitely the effect of any individual protective apparatus. Experience has shown, however, that the guard wire constitutes one of the most efficient systems of line protection, and contributes largely to successful operation during storms. During the earlier lightning seasons the neutral of the system was not earthed, and unquestionably many interruptions and much loss of apparatus resulted from not employing this system. One of the troubles caused by lightning is occasioned by the arcing-over of insulators, which with an insulated system having considerable capacity to earth generally results in an intermittent arc to earth, thereby setting up dangerous surges in the system. These surges lead to cumulative trouble and cause discharges on the arresters of the other two phases, increasing in severity until finally a second flash-over takes place (generally at the arrester gear itself) and short-circuits the phases. By earthing the neutral through a resistance, any arc to earth is immediately isolated by the operation of the Merz-Price balanced relay system, and the arresters are not called upon to continue operating. A star-delta transformer is employed for earthing to avoid disturbance to telephones. Since the neutral of the system was earthed it has been found that in the majority of cases where an arc has occurred over a line insulator the fault has been isolated so rapidly as to prevent damage to the insulator, and the line has been immediately put back into service by closing the switches.

(*To be continued.*)



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THE WEEK IN THE SHAREMARKET.

Better, but Fluctuating—European Complications Still Feared.

Up to Thursday the whole tendency of the market this week was upward. Considerable business was done, in the smaller diamonds and in the tin stocks, and the market presented a very favourable appearance. The news from Europe, however, damped enthusiasm, and until the trouble over Albania is settled dealers will remain nervous. All Rand stocks, with the exception of one or two that have had rises lately, exhibit a firmer tendency. Some of those that rose early in the week relapsed on Thursday, and the position is, of course, governed by the course of International politics in the next few days.

	* Friday, 18th.	* Sat., 19th.	* Mon., 21st.	* Tues., 22nd.	Wed., 23rd.	Thurs., 24th.
African Farms ..	17 0B	16 9B	16 9B	17 0	17 3B	16 9B
Apex Mines ..	27 6	27 6	27 0B	27 0B	27 6B	27 3B
Aurora West Uniteds	10 0B	10 0B	—	—	—	—
Bantjes Consolidated	23 6B	23 3B	23 3	23 3B	23 0B	23 6S
Benoni Consolidated	3 6	3 6	3 4B	3 6	3 4B	3 0B
Blaauwbosch Diam.	—	—	110 0S	—	105 0B	102 6B
Brakpan Mines ..	88 0B	88 6B	—	86 6B	86 9B	86 0
Breyten Collieries	—	31 6B	31 0B	—	31 0B	31 0B
British S.A. ..	24 0B	23 0B	—	—	—	—
Bushveld Tins ..	0 11B	0 11B	0 11B	0 10B	—	0 10
Cassel Coals ..	—	12 6B	—	12 6B	—	13 0B
City & Subs (£4) ..	49 9B	49 6B	50 0S	49 3B	50 0	50 0
City Deeps ..	69 0B	70 0B	69 6B	70 0B	72 3	71 3
Cloverfield Mines ..	6 7S	6 4B	6 3B	6 4B	6 4B	6 3B
Clydesdale Colls. ..	—	—	8 6B	—	—	8 6B
Concrete Constr. ..	—	—	—	—	4 0B	4 0B
Cons. Investment ..	22 6	—	—	—	—	—
Cons. Langlaagtes	28 0B	28 0B	28 0B	—	28 6	27 9B
Cons. Main Reefs ..	20 3	20 6B	20 6B	20 6	21 0	20 6B
Cons. Mines Select.	13 9B	14 0B	15 0S	13 6B	13 6B	14 6S
Coronation Colls. ..	—	—	16 0B	—	—	—
Coronation Freeholds	—	—	0 5B	0 5B	0 5B	0 5B
Coronation Synd. ..	3 6B	3 6B	4 6	3 B	4 0B	4 6
Crown Diamonds ..	9 6	9 0	8 0	8 0B	8 3B	8 0B
Crown Mines ..	150 0	150 0B	150 0B	—	150 6B	—
East Rand Centrals	9 9B	9 9B	9 6B	9 9B	9 9B	9 6B
East Rand Coals (2/6)	1 9B	1 10B	1 10	1 10B	—	1 9B
East Rand Deeps ..	2 8	2 8B	2 8B	—	2 8B	—
East Rand Props.	58 0S	57 6B	58 0	57 0B	57 6B	—
East Rand Debs. ..	£95	£94½B	£95B	£95B	£95B	£95B
Eastern Golds (1/-)	1 10B	1 10B	1 9B	1 10	1 9B	2 0S
Ferreira Deeps ..	—	66 0B	—	—	—	—
Frank Smith Diam.	11 6B	11 6	11 3B	11 6B	11 6B	11 6B
Geduld Props. ..	23 0B	24 0	24 0S	23 6B	24 0B	24 0
Geldenhuis Deep ..	—	32 6B	31 6B	32 0B	—	33 6B
General Minings ..	18 0B	18 0B	—	—	—	—
Glencairns	—	—	3 0	—	—	—
Glencoe (Natal) Colls..	7 6B	7 3B	7 0B	7 0B	7 0B	—
Glynn's Lydenburgs	21 0B	20 0B	20 0B	20 0B	21 0S	20 0
Government Areas	22 6B	22 6B	22 6	22 9	22 9	22 3B
Hex River Expls.	0 6B	0 9B	0 6B	0 8B	1 0B	0 6B
Jumpers	6 0S	—	—	—	—	4 3B
Jupiters	10 6B	10 9B	10 6B	10 6B	11 0	10 6B
Kaalfontein D. (2/6)	0 5S	0 5S	—	0 5S	—	0 5S
Kleinfontein Estates	—	18 6B	—	—	—	—
Klerksdorp Props...	3 0S	3 0S	2 9B	3 1S	2 9	2 8B
Knight Central ..	13 3	13 0B	13 0B	13 3	13 0B	13 0B
Knights Deep ..	—	44 6B	—	—	—	45 0B
Lace Props. ..	3 10	3 7B	3 10	3 10	3 10B	3 9B
Luipaardsvlei Est.	—	—	—	8 9B	6 9B	8 9B
Lydenburg Gold Fms.	2 7B	2 7B	2 7B	2 7B	2 7B	2 8B
Main Reef Wests ..	15 9B	16 0B	15 9B	15 0B	15 3	15 0
Main Meef West Deb.	—	—	—	£94S	—	£94S
Middlevlei Estates	1 2B	1 2B	1 0B	—	—	1 1B
Modder B's ..	78 6B	78 6B	78 0B	80 0	82 0	82 0S
Modder Deeps ..	37 6B	37 6B	37 6B	37 6B	38 0B	37 0B
Natal Navigation Col.	16 0S	16 0S	16 3S	16 0S	15 0B	—
New Boksburgs ..	—	1 0B	—	2 0S	1 0B	—
New Eland Diam.	25 0B	25 0B	25 0B	—	—	—
New Era Cons. (5/-)	8 0B	8 0B	7 9B	8 0B	8 0B	8 0B
New Geduld Deeps	2 5B	2 5B	2 4B	2 5B	2 4B	2 4
New Kleinfonteins	22 0B	22 3	22 0B	22 3B	23 0B	22 3B
New Modders ..	258 9B	262 6B	262 6B	260 0B	267 6B	—
New Rietfonteins ..	6 0B	6 0B	6 0B	6 3B	6 3B	6 0B
New Unifieds ..	16 0S	—	16 0S	16 0S	16 0S	13 6B
Nigels	17 6B	—	—	—	—	—
O.F.S. & Trans. Dia.	1 9B	1 9B	1 9B	1 9B	1 9B	1 9B
Pickstone Golds ..	—	40 0B	40 0B	40 0B	40 0B	40 0B
Potchefstroom Est.	—	—	—	1 0B	—	—
Premiers Def. (2/6)	—	—	235 0B	—	—	—
Premier Pref. (5/-)..	177 6B	177 6B	177 6B	181 3B	182 6B	180 0B
Pretoria Cement Co.	53 0B	53 0B	53 0B	53 6B	54 0B	54 6B
Princess	—	—	—	—	7 0B	—
Rand Collieries ..	6 3B	6 3B	6 3B	6 3B	—	—
Rand Klips ..	1 10B	1 10B	1 10B	1 10B	1 9B	1 9B
Rand Nucleus ..	2 8B	2 8B	2 8B	2 9B	2 9B	2 8B
Randfontein Deeps	5 3B	5 6B	—	5 6B	5 3B	—
Randfontein Estates	29 6	29 6	29 6	29 9	30 0	30 0B
Robinson Deeps ..	39 0B	39 6B	39 0B	39 0B	40 6B	41 6
Rooiberg Minerals	36 0B	35 9B	36 0	36 0B	36 6	36 3
Roodepoort Durbans	—	—	—	20 0B	20 0B	—
Rood. Durban Deeps	—	23 9B	—	24 0B	24 0B	—
Ryan Nigels ..	3 6B	4 0S	4 0S	3 6B	4 0S	4 0S
Shebas	—	5 0B	5 0B	—	5 0B	—
Simmer Deeps ..	3 0B	3 1B	3 6S	3 3S	3 0B	3 0B
S.A. Breweries ..	40 0B	40 0B	40 0B	40 0B	40 0B	40 0B
S.A. Gold Mines ..	—	—	—	—	17 0B	—
S.A. Lands ..	4 4B	4 6	4 5	4 5B	4 4B	4 4B
Springs Mines ..	16 9B	17 0B	17 0B	17 0	16 6	16 9
Sub Nigels	—	—	12 6B	12 6B	12 9B	13 0S
Swaziland Tins ..	39 0B	39 0B	40 0B	43 0	43 0B	42 0B
Trans. & Delagoa ..	37 6B	—	—	37 6B	—	37 6B
Trans. Coal Trusts	50 6B	51 0	50 0B	50 9	51 3	50 9
Trans. Cons. Lands	—	—	27 6B	28 0B	29 6S	28 0B
Trans. G.M. Estates	54 0B	—	—	—	—	—
Tudors	2 0S	—	2 0S	—	2 0S	2 0S
Van Dyks	—	—	—	—	—	2 6B
Van Ryn Deeps ..	28 9	28 9S	29 0B	29 6B	29 9	29 0B
Village Deeps ..	—	45 0S	46 0S	46 0S	45 0B	45 0S
Vogel. Cons. Deeps	1 9B	2 0B	—	2 0B	1 9B	2 0B
West Rand Estates	4 0B	4 0B	4 0B	4 0B	—	4 0B
Witbank Collieries	47 6B	47 6B	—	47 3B	—	47 0B
Witwatersrands ..	—	—	—	70 0	70 0B	—
Wit Deeps ..	54 6B	54 6B	54 6B	55 6	56 9	55 6B
Wit Townships ..	26 0B	26 0B	26 0B	26 0B	—	26 0B
Wolhuters	17 6	17 3B	17 6	17 0B	17 6	17 9
Zaaiplaats Tins ..	37 6B	—	37 9B	38 9	39 3	38 3B

B Buyers. S Sellers. * 40 Shares.

The eleventh annual Congress of the South African Association for the Advancement of Science will be held at Lourence Marques from July 7 to 12 (inclusive), under the Presidency of Dr. A. W. Roberts. The Congress will be opened by the Governor-General of Mozambique and His Worship the Mayor, at the Town Hall, at which Dr. A. W. Roberts, F.R.A.S., will deliver his presidential address, followed by presentation of the South Africa Medal and Grant to Dr. W. A. Rogers, M.A., F.G.S.

Pilgrims Rest Discoverer's Rights.

Application has been made by the undermentioned to be regarded as a discoverer of gold in the mining district of Pilgrims Rest, Transvaal Province. Name and address: Captain William George Frederick Barnard, P.O. Box 1, Sabie, Transvaal; mineral, gold; locality, Waterval No. 527; farm owner, Amy Laura Palmer married to C. E. H. Poole, and Evelyn Ada Palmer, married to J. P. O'Callaghan.

INVESTORS' DIARY.

The following company meetings have been announced:—

May 10.—Roberts Victor.
May 16.—Wit. Deep; Marievale Nigel; Vogel Deep.
May 21.—Apex Mines; New Kleinfontein.
May 23.—Knight Central; Cloverfield Mines.
May 27.—Transvaal Coal Trust; Brakpan Mines; Springs Mines; New Era Consolidated.
May 29.—Roodepoort United; West Rand Consolidated; Meyer and Charlton; New Goch.
May 30.—Sacke Estates; Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries.
June 3.—Moderfontein B.; Robinson.
June 4.—Rose Deep; Village Deep.
June 5.—Durban Roodepoort Deep; City Deep.
June 6.—Bantjes Consolidated; Geldenhuis Deep; Crown Mines.
June 18.—Rand Mines.
June 27.—A. Goerz and Co.
July 15.—Transvaal Consolidated Lands.

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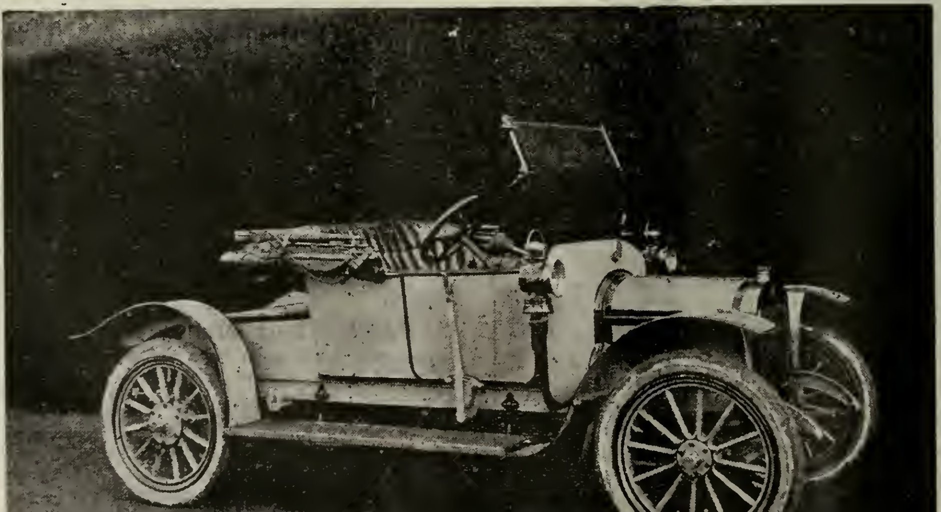

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Automobile Notes.

Mr. Jarney, engineer to the British Motor Cab Company, has invented a device which makes it possible to run a motor car on a mixture of paraffin and petrol. He has completed a series of tests with the new device, and claims to have overcome the main drawback attending the use of such a mixture—the difficulty in starting an engine—by a device which injects a few drops of pure petrol into the carburettor. It is stated that Mr. Worby Beaumont, consulting engineer to the Royal Automobile Club, has made experiments with the fuel, and obtained satisfactory results. Mr. Jarney says that the British Motor Cab Company will be able to offer the fuel to its drivers at 10½d. a gallon.

* * * *

A German chemist has, according to a Berlin paper, succeeded in discovering a suitable substitute for petrol. The new fuel is obtained, like petrol, from petroleum, but is said to cost so much less to produce than that spirit, that it could be marketed at one-third of the price. The results of the tests, carried out by responsible experimenters, show that the explosive pressure of the new fuel exceeds that of petrol, consequently the efficiency of the engine in which it is used would be increased. It is further claimed that there are no deposits arising from combustion, and that it is, like petrol, effective for cleaning purposes. A trial run was made recently, over a course of 25 miles, with an automobile using this substitute as fuel, and it is stated that throughout the run the engine worked faultlessly. A company with a capital of £100,000 has been floated to manufacture this product.

* * * *

The 25th day of September next has been fixed for the Tourist Trophy Race in the Isle of Man. It is to be an International race for stock motor cars, and will be run under the open competition rules of the R.A.C. over a 300 miles' course. The supplementary regulations have been published in the *R.A.C. Journal*, and provide, among other things, that the entrants shall be in every respect, *bona-fide* " stock " cars, and no alterations or additions will be permitted, except such as are rendered necessary by the requirements of the regulations, such as, for instance, the fitting of a tank capable of carrying 30 gallons of fuel. The Technical Committee will be called upon to exercise keen vigilance to prevent the entrance of any car that is not identical with that which the manufacturers supply to their customers. An ordinary chassis can, with a few alterations in connection with compression space, cam profiles, valve lift and setting of magneto, be converted into a veritable racer. Carried out thoroughly, this race should provide the purchaser with much valuable information for guidance in the choice of a car. It is intended that next year's race shall be one for cheap cars, and confidence is freely expressed in many quarters that British-made cars will be forthcoming to compete successfully with the cheap American car now so much in evidence in this country.

Cape Motor Regulations.

In the Cape *Provincial Gazette* is published the text of a draft ordinance which it is proposed to introduce in the Provincial Council to make provision for the registration and

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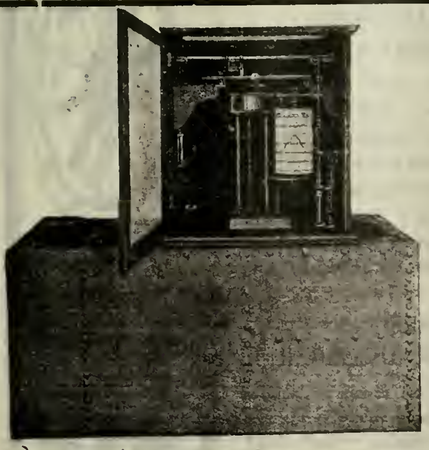

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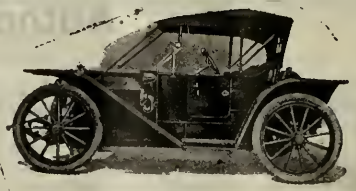

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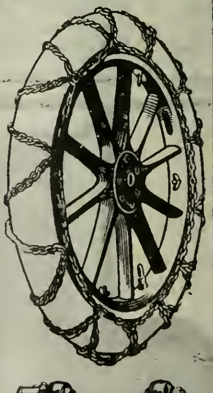

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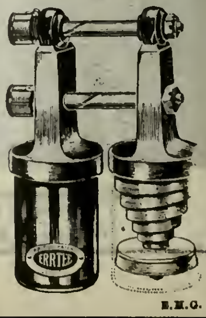

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licensing of motor cars and the licensing of motor car drivers and in respect of other matters relating to the use of motor cars upon public roads in the Province of the Cape of Good Hope. It is intended that the ordinance shall come into operation on January 1 next. The ordinance deals with all classes of motor vehicles, the interpretation of " motor car " being any vehicle self-propelled by mechanical power and used for the purpose of conveying persons or goods; the expression " motor car " shall, except in section 4, include a cycle or velocipede with or without side car, similarly propelled, in the ordinance called a motor cycle; but the expression shall not include a tramcar plying or moving on a public road by lawful authority, nor shall it include any so-called traction engine self-propelled by mechanical power and used or intended to be used for hauling one or more vehicles, nor shall it include a steam roller.

Imperial Motor Transport Conference.

During the month of July an Imperial Motor Transport Conference is to be held in London at the palatial quarters of the Royal Automobile Club. The Conference will enjoy the distinguished presidency of H.R.H. Prince Arthur of Connaught. The Executive Committee represents on the one hand all the recognised bodies connected with the manufacture and use of motor vehicles, and other engineering experts connected with the Dominions and Colonies, and also with certain large users and controllers of industrial motor vehicles. Mr. Horace Wyatt, organising hon. secretary, calls attention particularly to the fact that the Conference deals with motor transport, including all the industrial uses of motor vehicles, and not with the touring car and the use of motor purely for pleasure. Invitations to attend the Conference are being sent to all portions of the Empire. It is hoped that the Government Departments throughout the Empire interested in the development of road transport will be represented, and also that delegates will be representative of the industrial community, as, for example, the Chambers of Commerce, Boards of Trade, Agricultural and Planters' Societies, carrying and coaching companies, municipal and road authorities, and important firms concerned in the engineering and motor trades.

Finance, Commerce, and Industries.

Building. Eight municipalities in the Transvaal Province during the month of March approved plans having an estimated value of £124,218, as against £150,768 for the month of February, showing a decrease of £26,550. Seven municipalities in the Cape Province approved plans having an estimated value of £31,440, and the Durban Municipality passed plans having an estimated value of £15,912. Estimated values of buildings the plans of which have been approved by the undermentioned Municipal Councils for the month of March, 1913: Johannesburg, £80,869; Boksburg, £3,455; Benoni, £17,297; Germiston, £4,797; Krugersdorp, £8,705; Pretoria, £7,062; Roodepoort, £1,000; Springs, £1,033; Capetown (February), £3,505; Woodstock (February), £11,550; Simonstown, £200; Kimberley, £2,065; Oudtshoorn, £220; Cradock, £12,000; Queenstown, £1,900; Durban, £15,912; total, £171,570. Tenders accepted by Government for public buildings during the month, and not included in the above amount, £96,904 18s. 8d.

* * * *

The Railway Report. From the report of the Railway and Harbour Board on the operations for the year ended on the 31st of December, 1912, we learn that the earnings of the harbours and minor ports of the Union in 1912 amounted to £947,039, and the expenditure to £808,521, leaving a gross profit of £138,518 as compared with £112,508 in 1911. Interest, etc., called for a further outlay of £378,254, and converted the gross profit into a net loss of £239,736 as against £260,382 in the previous year. We give below the details of the gross profits, interest charges, and net losses:

	Gross Profit.	Interest, &c.	Net Loss
Capetown	£56,476	£116,974	£60,498
Mossel Bay	1,282	3,828	2,546
Port Elizabeth	39,138	48,585	9,447
East London (loss) ...	3,562	50,889	54,451
Durban	50,526	143,044	92,518
Minor Ports (loss) ...	5,342	14,934	20,276
	£138,518	£378,251	£239,736

The net losses in 1911 were: Capetown £75,505, Mossel Bay £693, Port Elizabeth £20,933, East London £54,119, Durban £89,697, Minor Ports £19,435; total £260,382. The Commissioners point out that each of the harbours shows an increase in the revenue earned, Capetown reflecting the largest, viz., £51,691. The proportionate increases of Port Elizabeth, East London, and Durban are almost identical, viz., about 10 per cent. The same percentage of increased expenditure was not maintained at the several ports as in the case of revenue. At Capetown the increased expenditure was approximately 16 per cent., at Port Elizabeth 5 per cent., at East London 8 per cent., and at Durban 1 per cent., but in regard to the last-mentioned port the Commissioners say it must be remembered that Durban receives no credit for the work done for the railways, and is in an exceptional position in comparison with the other ports of the Union. Dealing with the net results of the working of the combined harbours, the Commissioners remark: " It is recognised that these results are not satisfactory, but it should be remembered that the figures on which interest and working costs are calculated call for considerable revision. A committee of officers has been engaged for some time, in consultation with the Port Advisory Boards, in revising the capital allocation as between Railways and Harbours, in order that all the ports may be treated on the same basis. Its report is expected shortly, and the Board will thereafter formulate its recommendations."

* * * *

A Year's Insolvencies. The following statements have been forwarded by Mr. H. Gibson to the Capetown Chamber of Commerce, dealing with insolvencies in Cape Colony for last year:—I have to acknowledge the courtesy of the Government Department concerned for placing me in a position to supply the following information, on the same lines as formerly: The surrenders have been as follows: Cape Province—Voluntary, 1910, 320; 1911, 229; 1912, 270. Compulsory, 1910, 84; 1911, 86; 1912, 111. Total, 1910, 404; 1911, 315; 1912, 381. Total assets (estimated in the case of compulsory sequestration), 1910, £409,122; 1911, £246,121; 1912, £329,727. Total estimated liabilities, 1910, £656,922; 1911, £503,996; 1912, £543,860. Percentage of assets to liabilities, 1910, 62·27; 1911, 48·82; 1912, 60·62. Cape District only: Voluntary, 1910, 75; 1911, 50; 1912, 50. Compulsory, 1910, 40; 1911, 34; 1912, 45. Total, 1910, 115; 1911, 84; 1912, 95. Total assets (estimated in the case of compulsory sequestration), 1910, £141,883; 1911, £79,288; 1912, £64,419. Total estimated liabilities, 1910, £254,383; 1911, £137,743; 1912, £106,886. Percentage of assets to liabilities, 1910, 55·77; 1911, 57·67; 1912, 60·27. The number of rehabilitations have been 164, 202, and 201, respectively, for the several periods. The figures given are, as on previous occasions, approximate only, since the assets and liabilities in the case of voluntary surrenders are taken from the schedules filed by the insolvents, and in the case of compulsory sequestrations, the information has been taken from actual results where the liquidation accounts have been filed.

In a few instances only has it been impossible to obtain fairly accurate particulars. Last year's report indicated that the figures both for the Province and the Cape District had returned to the normal. On the present occasion this position has been maintained so far as the Province is concerned, whilst the district shows a decided improvement. This improvement is really more marked than is at first apparent, owing to the considerable development in trade and agriculture which has taken place during the last decade, and the consequent accumulation of wealth. In other words, the proportion of liabilities in insolvent estates to the total capital invested in the relative areas must have very considerably declined since 1902—the year taken in my last report for comparative purposes. Another distinctly satisfactory feature is the rise in the percentage of assets to liabilities to something over 60 per cent. in both Province and district, indicating, as it probably does, a more healthy state of trade generally.

* * * *

Insurance at the Cape in 1911.

According to the Secretary for Finance, the Cape Province business of non-Colonial insurance companies at the close of the year 1911, stood at 27,621 policies, assuring £11,246,972. This shows an increase on the previous year's figures of 1,670 policies, and the sum assured of £494,575. At the end of the year 1911, the number of Colonial policies in force was 72,805, and the total sum assured was £13,016,600. This shows an increase on the previous year's figures of 9,997 policies, and the sum assured of £1,020,495. Combining the whole business of the companies, non-Colonial and Colonial, for the year 1911, there is a total increase of 11,667 policies, and of £1,515,070 in the sums assured. Reviewing the business of some of the individual companies, the following principal increases in the sums assured are noticeable:—S.A. Mutual, £708,187; African Life, £228,779; Southern, £196,681; Norwich Union, £185,895; African Homes Trust, £96,305; Colonial Mutual, £85,022; Law Union and Rock, £67,465; National Mutual, £64,755; Yorkshire, £83,150; General Life, £23,411; Commercial Union, £19,689; United Provident, £17,042. The following are some of the decreases, those below £10,000 have not been shown:—Equitable of the United States, £76,476; Star, £29,224; Union, £15,110; Mutual of New York, £14,698. The progress of life assurance business in the Province may be observed from the following figures, showing the policies in force and the sums assured in the years 1896, 1901, 1906 and 1911:—

Year.	Policies in Force.	Sums Assured.
1896	30,100	£11,510,531
1901	49,720	14,765,528
1906	84,560	20,936,614
1911	100,426	24,263,572

The average sum assured per head of the European population of the Province is estimated at £41. This proportion is high in comparison with other countries, but, if the total population of the Cape Province of all races is included, the average sum is a little over £9 9s. per head.

The Rand Water Board has accepted the following tenders under Contract No. 127:—Messrs. Stewart & Lloyds (S.A.), Ltd.—35,000 feet 15in. welded pipe, £13,533 10s. 2d.; Messrs. Stewart & Lloyds (S.A.), Ltd.—5,000 feet 15in. welded pipe, wound with jute, £2,026 0s. 10d.; Messrs. Baerecke & Kleudgen.—11,000 feet 15in. welded pipe, £5,137 18s. 4d.; Messrs. Stewart & Lloyds (S.A.), Ltd.—15in. valves and specials, £627.

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Notes and News.

Natal Navigation Collieries. The Natal Navigation Collieries, Ltd., at Hatting Spruit are doing some very interesting work at one of their properties. A mine which was abandoned some months ago on account of fire is being reopened, or is about to be reopened. A number of boreholes have been put down, and the workings are being flushed with sand and water. We understand that the company's sound position is being well maintained, and that were more trucks available the output could be substantially increased.

* * * *

Magadi Soda Co. Signor Caviochoni has (says a Central News telegram from Rome) just forwarded his official report upon his visit to Lake Magadi, in East Africa. The report states that the lake in question is a lake of pure soda, and although at a distance it appears to be of water, its surface is solid and dazzlingly white. The lake comprises 30 square miles, and at present a considerable quantity of soda is daily taken from it, while a railway is under construction from the lake to the Uganda Railway. When the railway is completed it is expected that Lake Magadi will supply soda to the world.

* * * *

Kumst Diamonds. The secretary of this company has kindly forwarded us two reports concerning the operations of the Kumst Diamonds, Ltd. They are somelengthy and were received somewhat late for publication. We gather from them that some 22 shafts have been put down to depth varying from 5 to 58 feet. The deepest shaft is said to have passed through yellow ground and floating reef, and to have reached "blue." Another shaft, No. 20, is down 45 feet, apparently in yellow ground, and a paddock, 40ft. by 40ft. square, has been commenced adjacent to it. From this shaft a small blue diamond was recovered. All the shafts mentioned are on "pipe" No. 1, which is stated to have an area of fully 9,000 claims. Another "pipe," No. 2, is said to have a claim area of about 4,000 claims, of which 2,000 are on the property of the Roodeplaat Diamond Mines and 2,000 are on the ground of the Kumst Diamonds. A test wash of 150 loads of surface material from area No. 2 gave 15 carats to 150 loads. In Mr. Kumst's report he replies to the query as to whether the "pipes" carry diamonds by referring to the stones found near and upon the surface in this and adjacent properties. Our difficulty in connection with the so-called pipes is that no attempt is made, it seems, to discriminate between actual "mine ground" and volcanic breccia. To declare that these areas are "pipes," meaning that they are more or less entirely deposits of kimberlite is, in our opinion, and in view of the available evidence, to indulge in exaggeration. With the example of the Derdepoort deposit before them the public are entitled to more definite proof.

* * * *

Wit. Deep. The following information has been received with regard to the Wit. Deep development:—"The reef series has been encountered south of the water dyke from the east shaft in the 18th level, which is the lowest level of the mine. The Main Reef Leader assays 30·8 dwts. over 37 inches, and the Main Reef, which is 22 feet below the Leader, assays 5·5 dwts. over 37 inches."

* * * *

Main Reef West. The continued drop in the price of the Main Reef West shares has caused holders considerable disquietude, and the following remarks of the Chairman of the Klerksdorp Proprietary Mines, at the annual general meeting of the company last week, will be of interest. "Our action has been questioned in not selling the Main Reef West shares. To that my reply is that your board sold 8,100 shares for £17,158 10s.—an average of a little over 42s. 6d. per share. We are then asked why we did not sell the balance. Gentlemen, the Central Mining hold over 40,000 shares at a cost of about 45s., and this company had independent reports made on the property. Why did they not sell? The Consolidated Investment hold about 50,000 shares. They had their own reports. Why did they not sell? I will now give you the reasons for our not selling. We engaged the services of Mr. Creswell, an engineer of whose ability there can be no question, and the gist of his report was, if the property were vigorously handled, we should receive dividends for years at the rate of 25 per cent. per annum. If events had turned out that we received only 20 per cent., this investment in itself would have paid 5 per cent. dividend on the whole of your issued capital. Now, supposing the shares had risen in price, but we had sold, you would have told us, and very rightly, what is the use of employing an engineer at great expense to report for you if you reject the advice given in that report. Gentlemen, that report took over two months to make, and was a most exhaustive one. Quite recently, Mr. Creswell has examined the mine again, and he assures us that although in a poor zone at present there is no cause for alarm as to the future of the Main Reef West Mine."

* * * *

New Lisbon-Berlyn. The report of the New Lisbon-Berlyn, Limited, for the year ended Septmber 30, 1912, states that during the period under review 22,701 tons of oxidised ore were crushed in the mill at Frankfort, yielding 6,448·55 ozs., which realised £27,407; the cost of treatment amounted to £22,354, leaving a working profit of £5,053. The extraction obtained was 83·06 per cent. of the gold contents of the ore. This working profit is converted into a loss on the year of £3,151, owing to general prospecting charges, depreciation, interest, and general expenditure, and the credit balance of £934 brought down is converted into a debit of £2,217. The future of the mine depends upon the possibility of dealing with the pyritic ore profitably and upon a commercial scale. The New Districts Development Company, Limited, and the H.E. Proprietary, Limited, have agreed to assist within reasonable limits, with a view to getting the pyritic ore thoroughly tested.

* * * *

Springs Debentures. Arrangements are being made for the issue of £315,000 Six per cent. Debentures, the underwriting of which, we understand, has been taken up by the Consolidated Mines Selection Company. The debentures will be offered to the shareholders of the Springs Mines and the Transvaal Coal Trust companies at the price of £97½ per cent. Beyond the attraction of rather more than 6⅛ per cent. yield from an issue price of 97½, applicants for the debentures will be entitled to receive option certificates. These option certificates will give the holder of, say, £100 debenture the right at any time during a period of three years to take up an allotment of 100 £1 shares at par. If the rights are exercised, then, *pro tanto* to the number of shares taken, there will be ability on the part of the company to redeem debentures. At the present time the market price of the 630,000 £1 shares in issue is about 13-16 per share.

* * * *

The Western Witwatersrand. The geological sketch map of the Western Witwatersrand, which we print elsewhere in this issue, is based upon a larger and more elaborate one which was prepared by Dr. Mellor to accompany the paper which was lately read by him before the Geological Society of South Africa. The paper and map referred to may be obtained from the secretary of the Society at the office in the Standard Bank Buildings. In our map the Black Reef and dolomite series overlying the rocks of the Witwatersrand system are shown without any distinguishing markings; the quartzites of the Government, Hospital Hill and Orange Grove series are specially indicated by hatchings; and the Government reef is shown by a succession of dots along the lower edge of its proper quartzite band. The West Rand shale and Hospital Hill slate are indicated by wavy lines, while the additional use of lettering, as explained in the reference, will serve to make the various horizons perfectly clear. The duplication of certain horizons, as the Government Reef series and the West Rand (or Coronation) shale on Randfontein and Elandsvlei, for instance, will help to make it clear why Dr. Mellor assumes that a fault, called by him the West Rand fault, exists between these disconnected portions of the system. A comparison of this map with that published by Dr. Carrick, and approved by Dr. Hatch, will be extremely interesting, as showing a new reading of evidence that must have been very difficult, if not impossible, of interpretation by any means short of a point to point survey. The data referring to Witfontein, Brandvlei, and Elandsvlei will serve to throw a new light upon various borehole records which have hitherto been held to support quite a different view of the geological situation.

* * * *

Discrepancies in Assaying and Sampling. Discrepancies between the amount of gold won and the quantity which should apparently be forthcoming from an ore are inevitable. It is scarcely necessary to be reminded that to err is human, nor is it essential to prove that the most skilful and conscientious assayers and samplers are as human as other people, and that they cannot hope to establish absolute exactitudes. "Errors in sampling and assaying ores due to the presence of coarse gold" is the title of an interesting paper by Mr. Franklin White, read a fortnight ago at a meeting of the Institution of Mining and Metallurgy in London. Mr. White is well known both on the Rand and in Rhodesia, and we shall be surprised if his views do not provoke much discussion. The particular case mentioned by Mr. White is described in his paper as follows: "A considerable discrepancy between the amount of gold won and the quantity which should apparently have been forthcoming from the direct cyanide treatment of a large quantity of low-grade ore made a thorough investigation necessary of everything which might have affected the estimates made of the quantity of gold contained in the charges and remaining in the discharged residues, and it was also intended by a correction of the possible causes of error to ensure future estimates being of a more satisfactory character. The possibility of loss by robbery or any irregular leakage was considered and put on one side. The weight of the crushed ore forming the charges was checked and established with reasonable accuracy. The system of sampling the ore was examined and improved, the assay office operations were found to be satisfactory, the balances and weights were checked and found to be correct and efficient. As the ore was of low grade, varying between 2 dwts. and 5 dwts., it had been the practice to make the assay of each sample in three fusions of two assay tons each, to weigh the parted beads together and to record the return as one-third of the total weight. This system was discontinued, each button being weighed and the weight recorded separately. A series of elaborate experiments as to the effect of crushing a sample to different degrees of fineness before fusion and a most painstaking enquiry into the results obtained by quartering down samples, etc., prompted Mr. White to arrive at the following conclusions: "Where only a comparatively small number of grains of gold of unusually large size are present in an ore, the sample for assay should be crushed to pass sieves of 30-mesh or 40-mesh only. The fusions should be made in triplicate, and in the case of notable variations repeats should be made, the abnormally high results being rejected and not included in the averages. It could with reason be considered in such cases that there would be a tendency for any "average" to be in excess of the true value. It may be considered that this would involve considerable work and expense, but when important interests are at stake, and time and money has been spent in collecting and preparing samples, it would be short-sighted not to obtain as full and accurate information as possible just for the sake of economising a comparatively small number of assays. There is more chance of excess errors in the assays of ore charges than in those of the cyanide residues, and this would increase the probability that the 'monthly return' will show an apparent loss of gold, or 'unaccounted for,' greater than is actually the case."

TOPICS OF THE WEEK.

TRANSVAAL LAND PROBLEMS.

The Transvaal Landowners' Association has now completed ten years' existence and can point to a record of extremely useful work. The annual meeting this week provided the outgoing President, Mr. W. McCallum, with an opportunity to review the results of the Association's endeavours and the rapid progress made recently by farming in the Transvaal. Mr. McCallum's address amplifies the excellent report issued earlier in the week by the secretary, Mr. H. A. Bailey, in which an enormous variety of land questions and problems impinging upon the cultivation of the soil are exhaustively treated. Such subjects as recent and pending legislation, pests and stock diseases, all come within the purview of the Association, and were cogently dealt with in the Presidential Address. For us, however, the references to land settlement possess the most interest, since they may be taken as the considered views of the landowners of the Transvaal on this vitally important subject. " Land settlement by whites within our Province still continues to make progress," according to Mr. McCallum, " but very slowly, I regret to say. We need not expect, however, to see any great strides in this direction unless and until greater inducements are held out by our Government to attract the man from oversea. We have been told for years now that the Government do not favour hasty and ill-considered action in this connection, and they apparently mean what they say." He went on to point out that all the other Dominions are competing for that greatest of all assets to a new country—the emigrant of the right stamp—but we here seem to go upon the assumption that we are conferring a great favour upon every individual whom we allow within our doors. Last year Canada welcomed the arrival of 395,804 new citizens, while we grudgingly gave refuge within the Union to 446; and yet is it not patent to everyone that we want an increased white population much more than any of the other Dominions, for reasons which are familiar? Why our doors remain closed really puzzles the ordinary onlooker. Mr. McCallum referred to the existence of numbers of grown-up whites already with us, and to the rising generation in the country places and in the towns, who must be provided for, to a large extent, on the land. There is land and to spare for all if the question were only tackled in a businesslike way, and it must be tackled shortly, however unwillingly, as this large population growing up within our borders must be given some opportunity of earning a living; we cannot let them also go over to Canada or Australia! It is satisfactory to learn that this gradual increase in white settlement, slight though it is, coupled with the eradication of pests, better means of communication, etc., is having an effect upon the price of land, which is gradually improving, and we can safely look forward to that improvement being maintained. Amongst other bright features of the outlook, Mr. McCallum mentioned that the Government Pathologist is still experimenting with a view to arriving at a rust-resisting wheat, and, should he succeed in this, one can hardly imagine the importance of the result to the country generally. He also referred to the fact that a sufficient number of citrus trees of good kinds have been actually planted in the Transvaal since 1906 to ensure by 1920 an export of 50,000 boxes of fruit annually. On every hand there are undeniable signs of sure progress. Stock is improving in quality very materially, owing to the introduction of first-class strains from oversea, to dipping, and to the competition engendered by agricultural shows, etc. More certainly should be done to foster the ostrich industry in the Transvaal, as it would seem as if a large area of the Bushveld is more suitable for this than for the ordinary run of crops. Mr. McCallum commended the Government for their policy in the matter of agricultural education, for the importation of stock for the different experimental farms, for their efforts at water-boring, which might, however, be greatly extended, and for providing in the year's estimates for seven inspectors of Crown lands, this supervision being badly needed. Regarding the proposals which are being made from time to time by politicians of all shades of opinion with reference to the taxation of unoccupied land, Mr. McCallum stated that his reply to the agitation would be, shortly, this: " You provide the people and reasonable means of communication, and if there is any habitable unoccupied land left after a brief period to tax, so far as this Association's members are concerned, then tax it, and tax it well." This statement may fail to satisfy the critics who hold that the landowners are only just less responsible than the Government for the failure of South Africa to attract the settler, but, in the present financial circumstances of the land companies, it seems reasonable enough.

NEW RAILWAYS AND THE MINES

No less than four diamond mines, viz., Koffyfontein, Voorspoed, Crown Diamond Mine, and another in the Koffyfontein district, together with several coal mines, stand to benefit directly from the new lines of railway recommended by the Railway Board in its latest report. First it is recommended that the Springfontein—Fauresmith Branch be extended to Koffyfontein at an estimated cost of £150,740. As there is some uncertainty whether the volume of traffic to be carried will be sufficient during the first two or three years to ensure the extension paying full interest in addition to working and other charges at the ordinary fares and rates, it is proposed that the course adopted in the case of the extension from Springfontein to Jagersfontein be also followed in the case of the Koffyfontein Extension, viz.:—to charge such an addition to the ordinary fares and rates as will be sufficient to cover the anticipated shortfall until such time as the volume of traffic at ordinary rates is adequate to meet the expenditure indicated. The traffic to be carried will be chiefly for the Koffyfontein Diamond Mine and another diamond mine in the district. The railway people contend that as the diamond mining industry is in the nature of a diminishing asset, its conditions of working and the advantages derived by it from railway construction are such as to make it reasonable that the owners of the mines and others connected therewith should pay in railway fares and rates what may be needed to meet the public expenditure involved in the construction and operation of the line. Representations have been made from time to time for many years past, as to the drawbacks under which the diamond mining industry at Koffyfontein has laboured through lack of railway communication, and the personal enquiries of the Board confirm the correctness of what has been stated. Under present conditions, the difficulty and uncertainty of securing adequate transport from and to the railway, particularly at certain seasons, renders the regular working of the diamond mines very difficult and temporary stoppages for varying periods are not infrequent, while expansion of operations is more or less impossible for the same reason. In the case of mines like those at Koffyfontein, where, though the area is considerable, the yield of diamonds per load is poor, the working of the mine at a profit becomes exceedingly difficult except when the price of diamonds is high. On the other hand with the regular transport that a railway would ensure, considerable expansion in the mining operations would take place with regularity and with correspondingly improved financial results. Apart from the benefits to the mines themselves, the field of labour would be widened and a substantial impetus given to the development of agricultural and other resources of the district, which would be of general advantage.

The Board has already reported on an extension of the Eastleigh—Vierfontein branch to Bothaville, and now supplement what was then stated by recording that on the occasion of its recent further inspection it was glad to observe considerable further agricultural development adjacent to the proposed route of the extension. With regard to the connection from Vierfontein with the main line at or near Kroonstad, four routes are possible, viz.:—(1) To extend the proposed Vierfontein—Bothaville extension via the vicinity of the Valsch River to Kroonstad as indicated by the Board in its report. (2) A direct line from Vierfontein to Kroonstad, passing in close proximity to the Crown Diamond Mine, for the most part through good agricultural land. (3) A direct line from Vierfontein passing over a large coal area, and afterwards in close proximity to the Voorspoed Diamond Mine, as well as for the most part through good agricultural land to form a junction with the main line either at Jordaan or America, a few miles north of Kroonstad. (4) A direct line from Vierfontein passing over a large coal area as well as good agricultural land between the Rhenoster River and the Valsch River, and also south of Voorspoed Diamond Mines, and some miles north of the Crown Diamond Mine, to form a junction at the most suitable point on the main line between Jordaan and America. Route (4) possesses such distinct merits for agricultural and coal development over routes (1), (2) and (3) that it should be adopted, and the Board recommends it accordingly, and also the extension of the line from Vierfontein to Bothaville as recommended last year. It regards it as probable that the line will earn sufficient to cover working expenses, interest and depreciation in the near future.

It may be remembered that Parliament authorised the construction of a line of railway from Piet Retief to Vryheid (Almans Nek), a distance of 68¾ miles at a cost of £399,780. The Board now recommends that this line be continued into the town of Vryheid to link up with the railway from Glencoe Junction on the Natal line. The length of line to be constructed is about 9 miles, and Parliament will not be asked to vote further funds therefor as the savings effected on the construction of the Piet Retief—Almans Nek section can be utilised. It had been hoped to avoid the construction of the nine miles of railway by joining up with the private line of railway from Vryheid to Hlobane at Tendega Halt in the vicinity of Almans Nek, but the Administration has been unable to come to terms, on what it regards as an equitable basis, with the Vryheid (Natal) Railway, Coal and Iron Company, Limited, for the acquisition of the nine miles of its line from Tendega Halt to Vryheid, which are necessary in order to secure complete control of the working of the through route. The company, although offered a price which is held to be in excess of the cost of the construction of the section in question and substantially greater than the amount for which the section from the vicinity of Almans Nek to Vryheid can be built by the Administration, has not seen fit to accept the terms offered and require payment to an extent beyond what is considered fair and reasonable by the Administration. The grounds upon which the Company based its claim for a higher payment is understood to be its expectation of future profits on its line, a basis which the Administration on the other hand does not regard as a consideration which should be taken into account.

THE EXPLORATION OF RHODESIA.

In his recently issued annual report the most important point made by Mr. E. W. S. Montagu, the Secretary for Mines in the Government of Southern Rhodesia, is the advisability of more organised exploratory work being undertaken by qualified and experienced prospectors. This is a view which has often found expression in the columns of this journal, and we are sure there are few who have a knowledge of Rhodesia and its geology who will differ from Mr. Montagu. But the trouble is how a policy of effective mineral exploration may be inaugurated. That free lance of all mineralised areas—the prospector—has been roaming around Matabeleland and Mashonaland for well-nigh a quarter of a century now, and it will not be disputed that the sum total of the discoveries of this real soldier of fortune has been great indeed. But as Mr. Montagu rightly contends, the great majority of Rhodesian mines have been opened up on ancient workings and the virgin reefs of the country remain practically untouched. The Rhodesian prospector has in fact been a diligent searcher for the pot holes and crude stone mortars of the industrious of other days, and in the sense in which the word is employed in Australia or America he can hardly be regarded as a "prospector" at all. The peculiar conditions existent in Charterland have made him such. The adventurer of the mining industry is not to be expected to delve in incognitis or trudge through dense bush far from the railway and settlements in quest of hidden riches and untouched bonanzas, when he can locate mines in which the preliminaries of development have been achieved for him in the vicinity of working gold fields. The prospector is not generally a wealthy man, and to follow a policy such as Mr. Montagu advocates will obviously need capital and plenty of it. The British South Africa Mines Development Company was floated under official Chartered auspices some time ago, and we gathered that one of its primary functions was to lend generous assistance to such work as the Rhodesian Secretary for Mines now advises. Properly financed and properly supervised exploratory parties can only eventuate from some such company as this or from the controlling mining Houses. These latter appear to have their hands very full at present with mines producing and mines about to produce. Accordingly there seems to be every justification for asking why the Chartered Company itself, either directly or through the medium of its Mines Development subsidiary, does not step into the breach and organise the parties Mr. Montagu recommends. Rhodesia is a vast country and it is a moral certainty that something good would result from such a practical and official declaration of faith in the mineral possibilities of the territory. It occurs to us that the Rhodesian Geological Survey under the able leadership of Mr. H. B. Maufe, might achieve much in regard to the inauguration of a policy of extensive exploitation. The Geological Survey has issued interesting brochures on the stratigraphy and petrology of Southern Rhodesia, but as we had occasion to remark some little while ago the Survey's labours have been mainly productive of result possessing academic interest only. Were this important research department of the Government roughly to investigate areas as yet untapped by the prospecting element and were the Government to follow this up by giving more tangible support to mineral exploration than the advisory assistance offered by the Government Mining Engineer, Mr. Montagu's anticipations might secure realisation. In the absence of such support from the Administration or the already over-loaded mining corporations it is probable that the Rhodesian mineral explorer will continue to boil his billy where the miners of long ago inscribed the first chapters of Rhodesian industry.

THE GLENCOE COLLIERIES.

A Progressive Natal Proposition—The Coal Seams and their Value—Outlook for the Current Year—The Life of the Mine—The Property Described.

The coal fields of Northern Natal have proved themselves to be amongst the most valuable assets of that Province, and it may confidently be stated that their full industrial importance and value have yet to be realised. Year after year the output has increased steadily, and in 1912 the production reached the record total of 2,435,181 tons. By reason of the excellent quality of the product and the situation of the pits in relation to the port of Durban, the Northern Natal fields are most advantageously circumstanced, and there is undoubtedly ability to increase the output. The industry has had to suffer the disadvantages of labour shortage. Adequate railway facilities have, too, been lacking in the past, but it is understood that the present Administration is about to effect a substantial improvement in this direction, and that not only will more trucks be available in the future for the carriage of coal to the Coast, but that much better facilities for the despatch of coal from Hatting Spruit Station are to be made available. This station is in the centre of what is known as the Hatting Spruit coal basin, and it is to be greatly enlarged and made more worthy of the important area which it serves.

Mines of the District.

Within a radius of a few miles of Hatting Spruit are the following collieries: Glencoe (Natal) Collieries, Ltd., Natal Navigation, St. George's, and Hatting Spruit Collieries. The St. George's Company has just been absorbed by the Dundee Coal Company. Hatting Spruit is situated 240 miles from Durban, and the Glencoe Collieries, which were visited by a representative of this paper a few days ago, are connected with the Natal main railway by a branch line two and a quarter miles long.

History and General Geology.

The Glencoe (Natal) Collieries, Ltd., was registered in Natal on August 30th, 1901, to acquire a lease of the coal-bearing farms Clipsham, 714 acres, and Verdruk, 456 acres, situated in the Dundee district, Klip River County. Subsequently the freehold rights were acquired. Before flotation the property was thoroughly tested by a series of boreholes, and the coal was proved to be of excellent quality. At first sight this area could scarcely be expected to bear any really valuable seams of coal. Extensive outcrops of diorite (locally termed whinstone) are to be found all over the neighbourhood, and the presence of this igneous rock might be expected to greatly militate against the deposition of any economically valuable carboniferous beds. The diorite exists, however, as an overlying sheet, and although in places the seams are intersected and faulted by intrusive masses of whinstone the quality of the coal throughout the fields may be termed excellent.

Quality of the Coal.

Analyses made by Mr. S. B. Bilbrough, of Johannesburg, some little time ago arrived at the following results as the average over the whole Glencoe mine: Moisture, 1·11 per cent.; volatile hydro-carbons, 20·27 per cent.; fixed carbon, 70·09 per cent.; ash, 7·63 per cent. Sulphur was determined as being 1·42 per cent. of the contents. Further details of analysis are: Calorific value by Mahler bomb in calories, 7,946; or B.T. units, 14,294; or lbs. of water evaporated as from and at 212 deg. F., 14·81; pure combustible in the above analyses, per cent., 91·26; calorific value of combustible, lbs. water, 16·24. The analyses show uniform good quality over the whole mine, a low percentage of ash and high evaporation both per lb. of coal and per lb. of combustible. Practically the whole trade of the colliery is coastwards, the company doing a large bunker trade at Durban. The office of the company at this port is equipped with a Mahler bomb calorimeter, and samples of coal as supplied to steamers are regularly taken: these show that the high quality of the coal referred to above is maintained.

Glencoe Collieries: The Main Shaft.

Outputs to Date.

Up to the end of last year the total output of coal from the Glencoe mine had been one and a third million tons, the outputs since commencement of production in 1902 being, in long tons: 1902, 8,779 tons; 1903, 65,124 tons; 1904, 75,575 tons; 1905, 118,429 tons; 1906, 127,889 tons; 1907, 156,601 tons; 1908, 104,917 tons; 1909, 132,314 tons; 1910, 179,643 tons; 1911, 175,685 tons; 1912, 192,935 tons.

The Explosion.

The 1908 return, it will be noted, fell considerably below the output of the three preceding years. This was due to a

Glencoe Collieries: A General View of the Surface Equipment.

disastrous explosion which took place in the mine workings, and which, it will be recalled, was attended by serious loss of life. In this connection it may be remarked that, unlike the Transvaal collieries, the Natal coal mines are gaseous, and the precautions and regulations in force in Europe have to be stringently observed. In regard to these mines, there is a theory that the presence of the intrusive diorite or whinstone dykes has a deleterious influence in that these intrusions have a contracting effect on the coal seams, and that under the pressure exerted by them the volatile hydrocarbons are "chambered" between the different belts of diorite. These chambers, when tapped, exude inflammable gases. The coal where in contact with the dykes and for a few feet on either side possesses the appearance of having been burned. Of recent months, in the Glencoe mine, a considerable amount of restoration work has been continued in the areas affected by the explosion, and from 3,000 to 4,000 feet of roadways have been restored.

The Coal Seams.

There are two seams of coal in the property, the bottom seam being the main deposit worked. The average width of the bottom seam throughout the mine is 5 feet. This includes about one foot of shale, which has to be worked in conjunction with it, and is dumped. The top seam also is worked in some parts of the property, and developing roads are now being driven into it in several sections of the mine. The following is a section of the No. 1 shaft: Surface soil, 2ft.; sandstone, 4ft.; clay, 1ft.; "whinstone" (diorite), 117ft. 6in.; sandstone (metamorphic), 2ft. 8in.; whinstone, 2ft. 2in.; sandstone and bands of shale, 96ft. 6in.; shale, 10ft. 1in.; bands of sandstone and shale, 39ft. 5½in.; coal, 3in.; bands of sandstone and shale, 9ft. 8in.; coal with shale bands, 10in.; coarse sandstone, 27ft. 9½in.; fine sandstone and shale bands, 21ft. 5in.; shale and sandstone bands, 8ft.; coal (top seam), 3ft. 6in.; sandstone, 4ft. 2in.; coal (bottom seam), 6ft.

Glencoe Collieries: Another View.

Methods of Working and Underground Plant.

The mine is worked on the well-known pillar and stall system. In the first working about 33 per cent. of the seam is taken out, and on the return the pillars are exhausted. The roof is not so secure as in the average Witbank district mine, and large quantities of timber have to be used. In some parts very close timbering has to be employed. No doubt the presence of the intrusive diorite is mainly responsible for the careful attention that has to be given to the support of the roof.

Underground fourteen coal cutting machines are employed. Three of these are Sullivan punchers, six are of Siskol make, and five of Jefferys type. Power is supplied by a Walker compressor plant. This compressor is of compound type, with h.p. steam cylinder 21in. diameter, l.p. steam cylinder 35in. diameter, h.p. air cylinder 17in. diameter, l.p. air cylinder 28in. diameter, stroke 39in. Excellent ventilation is maintained throughout the workings. A double inlet improved Capell fan of 17 feet diameter is at work. This exhausts air from the upcast shaft and gives to the workings generally effective ventilation.

The Surface Installation.

The mine is well equipped with modern machinery. The screening plant comprises tipplers, jigging screens, plate picking belts and bucket elevator. In the washing plant section of the installation there are a 55ft. dross elevator, with buckets 24in. by 11in. by 11in., a set of jigging screens, bash tanks, felspar washer, jigging sieves, two sets of flight conveyors, and two refuse elevators. The boiler plant consists of eight Babcock and Wilcox boilers, and it is of interest to note that the furnaces are efficiently fired with the company's own fine coal product. The colliery is also equipped with a large coal bin of about eleven or twelve hundred tons capacity, complete with a conveyor. This bin has proved a most valuable asset, as in the absence of sufficient empties the product from the mine can be stored there to await the arrival of cars on the branch line. Last year during intermittent periods the company experienced a shortage in the supply of empty trucks, the bin having been put into operation on 88 working days, to prevent the mine from standing. On days when the supply of empty trucks was insufficient, and the storage bin was also full, the colliery lost considerably in output; this does not include the days that the mine was stopped and the available empties utilised in off-loading the storage bin when full.

Outputs, Profits and "Life."

The total output of the company last year was 192,935 tons, or an average of slightly over 16,000 tons per month. Returns were considerably restricted on account of labour shortage. The position in this regard has improved of late. There are on the books of the company about 950 coloured employees, but the actual working complement is only from 700 to 800. The total productive capacity of the mine is 800 tons per diem, and the production for 1912 would have been substantially higher but for scarcity of unskilled labour and at certain times a shortage of empty trucks. Increased labour recruiting charges militated against the earning of larger profits, but the total earning on the large capital of £250,000 was £16,298, excluding depreciation, and this admitted of a dividend of 3¾ per cent. being declared, leaving a balance of cash assets over cash liabilities, after providing for the dividend, at the end of the year of £14,928. Last year the prices of coal ruled low, and despite a larger output the profits were not increased. For the current year a number of the coal companies have agreed to work together to develop the export trade and make many of the coals interchangeable to secure the quicker discharge of trucks. Prices of coal, in sympathy with higher steamer freights and quotations elsewhere, are ruling higher, so that this year's profits should show a considerable advance. The

Glencoe Company has an agreement with the Natal Navigation Collieries for a joint selling agency in London. This has worked satisfactorily, and is being continued.

The future of this property, granted a satisfactory supply of labour and trucks, is seemingly a bright one. Development is being well maintained, and the more extensive exploitation of the farm Verdruk is now being undertaken. As to "life," from borehole and other evidence, the area of coal available is 911 acres; taking the bottom seam at 5ft. thick, this gives the quantity of coal in the area as 5,675,940 tons. Deducting coal extracted up to the end of 1912, viz., 1,387,890 tons, there was left a balance to be worked of 4,338,050 tons as from the end of last year. In arriving at these figures, no allowance is made for the top seam, which is now being developed in certain parts of the mine.

CAPITAL EXPENDITURE IN 1912.

Amounts Paid for Machinery and Materials—Last Year's Additions to Equipment.

II.—BARNATO SUBSIDIARIES AND THE BRAKPAN MINES.

We hereunder continue our examination of expenditures incurred by Witwatersrand mines last year on capital accounts. In our last issue we dealt with expenditures incurred under this head by nine mines of the Central Mining and Investment Corporation group, and this week deal with the additions to equipment on the producing mines and amounts spent on account of shafts, machinery and development of properties approaching the productive stage which are under the control of the Johannesburg Consolidated Investment Company. We also append a statement of this aspect of last year's work at the Brakpan Mines.

Consolidated Langlaagte.

Capital expenditure during 1912 was naturally a heavy item at this property, in view of the new surface plant, and the development and equipment of the southern section of the mine. The total amount expended was £318,968, of which £189,298 was spent on surface construction and £129,670 on underground work. By the end of the year the expenditure on surface equipment was drawing rapidly to a close, and as the work was well advanced underground capital expenditure will assume normal proportions, and the bulk of the profits earned will be available for distribution. Since the starting up of the new plant no important additions to plant have been made, with the exception of a 50-drill electrically-driven compressor, which was in course of erection at the end of the year, and alterations to the assay office.

New Rietfontein.

Here a change house for the use of white miners was erected at No. 1 shaft. Owing to the Rand Water Board being unable to supply a sufficient quantity of water during the latter part of the year, it was found necessary to erect a pumping plant at the cooling reservoir of the New Primrose Gold Mining Company, Ltd.

New Unified.

At the New Unified an Allen sands pump with necessary motor was erected in June, and an electrically-driven three-throw pump installed at the bottom of the shaft. A centrifugal pump and 35 h.p. motor are being put in for return water, and a 60 h.p. motor is being installed to run the crushers.

"State Mines."

During the year the following amounts were expended on capital account at the Government Gold Mining Areas on Modderfontein: Machinery and plant, £9,999 7s. 3d.; buildings, £11,384 12s. 5d.; permanent works—shafts, £189,903 1s. 8d.; development, £28,775 15s. 1d.; railway siding and station, £12,651 4s. 2d.; road making, £3 15s. One additional Babcock & Wilcox boiler was erected at the south-west shaft. The railway siding to the shafts, store, etc., was completed in October. During the year 12 additional semi-detached cottages and the secretary's house were completed, and the manager's house was erected. The general office and assay office are in course of erection, and will shortly be ready for use. Permanent drill sharpening shops were erected at the north-west, north-east and south-west shafts.

Witwatersrand.

The pile-blocks in the mill of this company are gradually being replaced by concrete foundations throughout. A new 250 h.p. Babcock boiler was installed during the year to replace five small Cornish boilers. A similar boiler is now under construction to replace the last five Cornish boilers still in use. Transformer houses connecting the mine with the Victoria Falls Power Company were erected at the main incline and vertical shafts. A 50-drill Robey air compressor was erected at the vertical shaft, and is in successful operation. Additions were made to the compound and native hospital to accommodate the full complement of natives. An extra battery of five stamps was erected to minimise the loss of tonnage caused by the stamps hung up for repair. A solution heating arrangement was installed for the more efficient treatment of the slime, which is giving very satisfactory results. A start was made with the additional slime and new tube mill plant, which, in the course of a few months, should very materially reduce the gold residues, and add to the profit per ton mined. In view of the satisfactory position underground, it has been decided to proceed with the installation of five tube mills with the necessary extension to the slime plant. By this means it will be possible to reduce the value of the residues and also increase the tonnage crushed. The work is now in hand, and when the plant is put into operation there is every reason to anticipate a further improvement in the profits. Capital expenditure on the mine has been a heavy item during the past two years. This was unavoidable on account of the opening up of the southern section. The additions to the reduction plant outlined above, together with the equipment and sinking of the south incline from the vertical shaft, will necessitate the expenditure of a considerable sum of money during the current year, but in 1914 capital expenditure should be considerably reduced, and the bulk of the large profits being realised should be available for distribution as dividends.

Glencairn.

At the Glencairn the only important new work undertaken last year was an extension to the slime residues dam.

Ginsberg.

A solution heating plant, for heating the slime solution, was installed, and has given satisfactory results by enabling the company to obtain more rapid settlement of the slime than otherwise would have been possible. A new air and circulating pump, together with a motor for driving same, were fitted to the mill engine condenser. An ambulance station, near the north shaft, was erected and equipped in terms of the Mines and Works Regulations. Drinking water services in both north and main shafts have been provided. The method of handling the return water was reorganised, and a new return water pumping station, equipped with two 6-inch Tangye centrifugal pumps and motors for driving same was erected. This has effected an economy as regards both labour and power. Various other repairs to the machinery, plant and buildings were carried out as they were required. There is an accumulation of slime in the old Balmoral dam amounting to some 60,000 tons. The question of installing the requisite machinery to treat this accumulation had been under consideration for some time past, and it was decided to erect a small plant which will enable 750 tons of slime to be treated per month. The plant has been ordered, and when it is put to work it is anticipated that a slight additional profit will be derived from this source.

Van Ryn Deep.

Under the heading of capital expenditure the following amounts were expended at this property during the year: Buildings, £19,573 9s. 5d.; machinery and plant, £42,806 14s. 4d.; permanent works, £44,319 19s. 8d.; development, £82,356 15s. 1d. A pump station and sump were cut at the 6th level east incline, and two Gould's 6in. by 16in. three-throw electrically-driven pumps were installed, capable of dealing with about 20,000 gallons per hour. At the main pump station at the west shaft a chamber large enough to take three more 5in. by 16in. Gould's pumps, if found necessary, was cut, so that the capacity can be brought up to a million gallons a day. Good progress was made with the work on the reduction plant, which was commenced about the middle of the year. The excavations and foundations for the tube mills, plate house, pump room, collecting tanks, treatment tanks, slimes tanks and Butters' filter were completed. The eight mortar blocks were cast, and the foundations of the mill house, mill bins and crusher station were completed. The excavations for the extractor house and sumps were nearly completed at the date of the annual report. During the year a manager's house, two new staff houses, and new offices were built, and a staff room added to the boarding-house. The native change house for 600 tropical natives was completed and is in use, and the extension to the compound was well in hand. The new workshops were put in commission, and the transformer house was also completed. Two blocks of single quarters of 12 rooms each were nearly ready for occupation at the end of the year, and a start was made with the foundations for eight married quarters.

Brakpan Mines.

At Brakpan Mines the expenditure on capital account for the year stands at £48,728. In accordance with the policy foreshadowed by the Chairman at the last annual meeting, all capital expenditure incurred during the year was provided for by appropriating a portion of the profits earned. It may be noted that of the amount appropriated under this head, the sum of £29,726 was in respect of the original equipment, the balance being in connection with certain additions to plant found necessary in the light of further experience. Additions to plant included the following principal items:—Two tube mills with twelve amalgamating tables (two additional tubes are on order); one 60ft. diameter sands collecting tank with necessary launders, conveyor belts and classifying cones, complete; one 65ft. diameter collecting tank with launders and piping; complete; one clarifying Merrill press for Butters' plant. At No. 2 shaft three-deck cages capable of handling 60 persons per trip replaced the skips in two of the winding compartments. Much time is saved in the transport of men and materials. The amount of water pumped remains about as reported during the previous year. The electric pumping system was extended to a point near the 15th level in the south incline. An underground shop for drill sharpening by machine was established near No. 1 shaft. This is in the experimental stage, but results to date indicate its value and probable success.

MINING MEN AND MATTERS.

Mr. H. S. MacGregor, manager of the Simmer Deep, has gone on leave. He is being temporarily replaced by Mr. Barclay, formerly of the Knights Deep.

* * * *

The resignation of Mr. James A. Hebbard, manager of the Langlaagte Estate and Gold Mining Company, is announced. Mr. Hebbard had been connected with the Robinson group for the past 22 years. It is his intention to leave for England at the end of the month.

* * * *

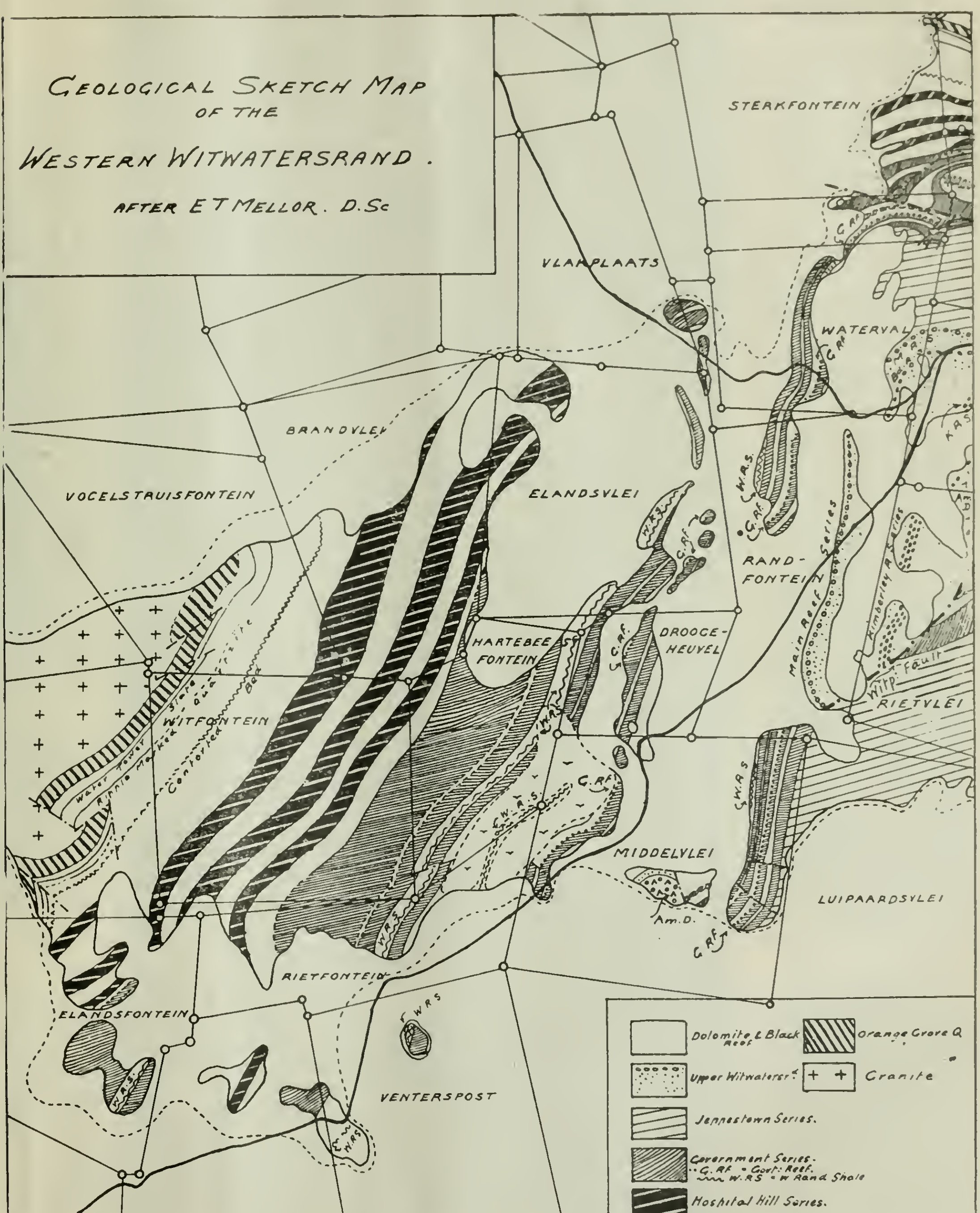
The death occurred at the Avenue Nursing Home this week of Mr. William Russel Slack, the secretary of the Transvaal Gold Mining Estates and Glynn's Lydenburg. Mr. Slack had been seriously ill for some time from enteric fever, from which his friends hoped that he would ultimately recover. Recently, however, he had a serious relapse. The deceased was one of the Rand's best known and most popular citizens.

* * * *

At the 22nd annual general meeting of the Institution of Mining and Metallurgy, held in London on March 13th, the scrutineers appointed to examine the balloting papers for the election of members of council reported that the following had been duly elected: Messrs. John F. Allan, R. Gilman Brown, John Cadman, T. C. Cloud, R. E. Commans, John H. Cordner-James, Arthur Dickinson, J. A. L. Henderson, Sir Thomas Henry Holland, G. T. Holloway, E. W. Janson, Frank Merricks, Humphrey M. Morgans, Arthur L. Pearse, Arthur E. Pettit, Hugh K. Picard, R. A. S. Redmayne, A. L. Simon, S. J. Speak, O. J. Steinhart, H. C. Taylor, S. J. Truscott, Stephen Vivian, and W. Fischer Wilkinson.

Boreholes as a Means of Saving Life.

Recent events have served to remind mining engineers of the advisability of preserving all boreholes put down for prospecting and other purposes. Hitherto most boreholes have been lost through the mining companies or others not being prepared to purchase the contractor's tubing put into the holes; the tubes have been withdrawn by the contractor on completion of boring operations, with the result that the boreholes collapse and are lost. In many cases a probable valuable asset has been thus thrown away for the paltry cost of the tubes—an item of, say, anything from £10 to £100, according to the diameter and depth of the borehole. A remarkable instance of a preserved borehole being the means of saving life has been experienced in the recent mishap at Egremont, Cumberland, where two men employed by the Townhead Mining Company, Limited, were imprisoned in the workings of one of that firm's mines through an inrush of water completely cutting off exit by the shaft. The men knew of a borehole to the rise of the shaft; they made their way to it, and soon got into communication with the officials at the surface, who had also gone to the borehole, some 150 yards from the shaft, and were able to converse with the imprisoned men. Arrangements were immediately made to send down through the borehole Thermos flasks containing hot drinks, food, etc., to say nothing of other comforts in the shape of candles, a watch, and such woollen clothes and wraps as could be safely put down a borehole 5in. in diameter. The borehole was also used for pumping air down to the men. The men were imprisoned 5½ days before the shaft was unwatered and they could be brought to the surface, and the borehole was the means of considerably allaying the fears of the management, to say nothing of the anxious relatives and friends of the entombed men. Stimulated by this notable example, mining companies and others ought in future to seriously consider the desirability of preserving all boreholes, even if at the time of boring their use as a means of life-saving, etc., may appear remote. Cases have been known where boreholes only partially tubed have remained good for twenty years or more. Apart from their use as a means of saving life, boreholes can be and are being used for water supplies and ventilating purposes; and as holes can be bored of a diameter large enough for a man to be lowered up and down, mining companies may consider making such provision where a second exit by shaft or other means does not exist. Moreover, a borehole of such large diameter might have other uses; it could be utilised for the lowering down of all timber required in the workings, a work of magnitude in some metalliferous mines which takes up much valuable time at the drawing shaft. Such a borehole could also be used for conducting electric cables to the workings, thus removing the danger of their presence in the shaft, with the further possibility of reducing the length of cable required. The question will no doubt be seriously considered in the future.



GEOLOGICAL SKETCH MAP
OF THE
WESTERN WITWATERSRAND.
AFTER E T MELLOR. D.Sc

RAND METALLURGY: SOME 1912 ACHIEVEMENTS.

Lower Costs and Higher Recoveries—Surface and Underground Economies.

A CONSIDERATION of the economic progress attained in Witwatersrand metallurgy of recent years resolves itself into two divisions. Firstly, there has to be considered the saving in expenditure effected both as regards outlay on capital account and the costs of operation; and, secondly, there is the increased percentage of recovery. Half a dozen years ago an eminent leader of the industry declared that the scope for improvement and saving in above ground operations was small and restricted. In comparison with the extensive field that exists in the mines, surface operations have very circumscribed limitations in so far as future economy is concerned. Admitting this, it is perhaps more than a little remarkable that whilst milling and cyaniding costs have decreased there has been little or no decline in the total working expenditure on a ton milled basis. The whys and wherefores of this seeming anomaly have received lengthy and periodical treatment in the columns of this journal, and it is scarcely our purpose here to revive reflection of the many complexities that have been antagonistic to a general reduction in operating expenditure.

Capital and Current Expenditures.

Not only have there been large declines in metallurgical operating charges, but very sensible reductions in capital expenditure have been effected. Improved methods of battery operation, of milling and subsequent grinding of classification, cyanidation and final precipitation have not only meant savings in current metallurgical expenditure and in the time required for treatment, but they have borne a most important result in that a 1,500 tons per day plant can be purchased and brought to the running stage for considerably less money and in a substantially shorter period of time than was practicable a few years ago. Furthermore the actual recovery has improved by several points per cent. In other words, an ore containing 10 dwts. of gold per ton is to-day made to yield 9·6 dwts., whereas half a decade ago 9·2 or 9·3 dwts. was deemed the practicable maximum. It would be an interesting study in economics to ascertain whether this improvement in plant efficiency in any way reflected the progression—if progression there be—of labour value below surface. The latter factor is obviously one difficult to gauge or give tangible translation to, and we will rest content with the expression of view that the improvement in metallurgical effectiveness has not been accompanied by a corresponding betterment in the efficiency of underground labour. Setting on one side the subject of relative capital expenditures, *i.e.*, amounts paid for mills and cyanide plants in the days of the "early tube mill epoch" and at the present, an enquiry into extractions and working costs on certain mines affords some very interesting data.

Statistics of Certain Mines Examined.

Comparing figures for 1910 and the last four months of 1912 thirteen mines of the Central Mining group show in the aggregate savings which on the basis of the six and three-quarter million tons treated last year represent an additional profit of £225,000. The lowest costs of any individual mine of the group are those of the Village Deep—3s. 7·8d. per ton for the whole year, and 3s. 5·6d. for the last four months of 1912. The City Deep's reduction costs, which for 1911 were 4s. 11d. per ton were reduced to 3s. 8·3d. in the last four months of 1912. Contrasting the same periods, it is interesting to observe that the Durban Roodepoort Deep Company's expenses declined from 5s. 2d. to 4s. Crown Mines charges were lowered by sevenpence per ton in the same period. As to recoveries, the New Modderfontein heads the list with an actual extraction of 97½ per cent., as against 96½ per cent. in 1910. The City Deep's extraction last year was 96·7 per cent., as against 95·7 per cent. in 1911—the first year of milling. The Village Deep recorded a recovery of over 96 per cent. as against 94·43 per cent. in 1910. The value of the residues was reduced from 0·345 dwt. to 0·276 dwt. The Robinson Company's 1912 residues were estimated to contain 0·378 dwt. per ton. Those discarded in 1910 contained well over half a pennyweight. As to other groups, it is satisfactory to note that the Consolidated Gold Fields group last year treated ore for 3s. 8d. per ton. At Randfontein and the East Rand Proprietary Mines both practice and results have improved. Barnato mines are installing tube mills extensively, and already a marked lowering in residue values is apparent. Brakpan Mines records highly satisfactory figures both for reduction and treatment costs, and for metallurgical effectiveness. Under the able technical guidance of Messrs. Torrente and White, the mines of the Albu and Goerz groups respectively are doing improving work.

The New Epoch.

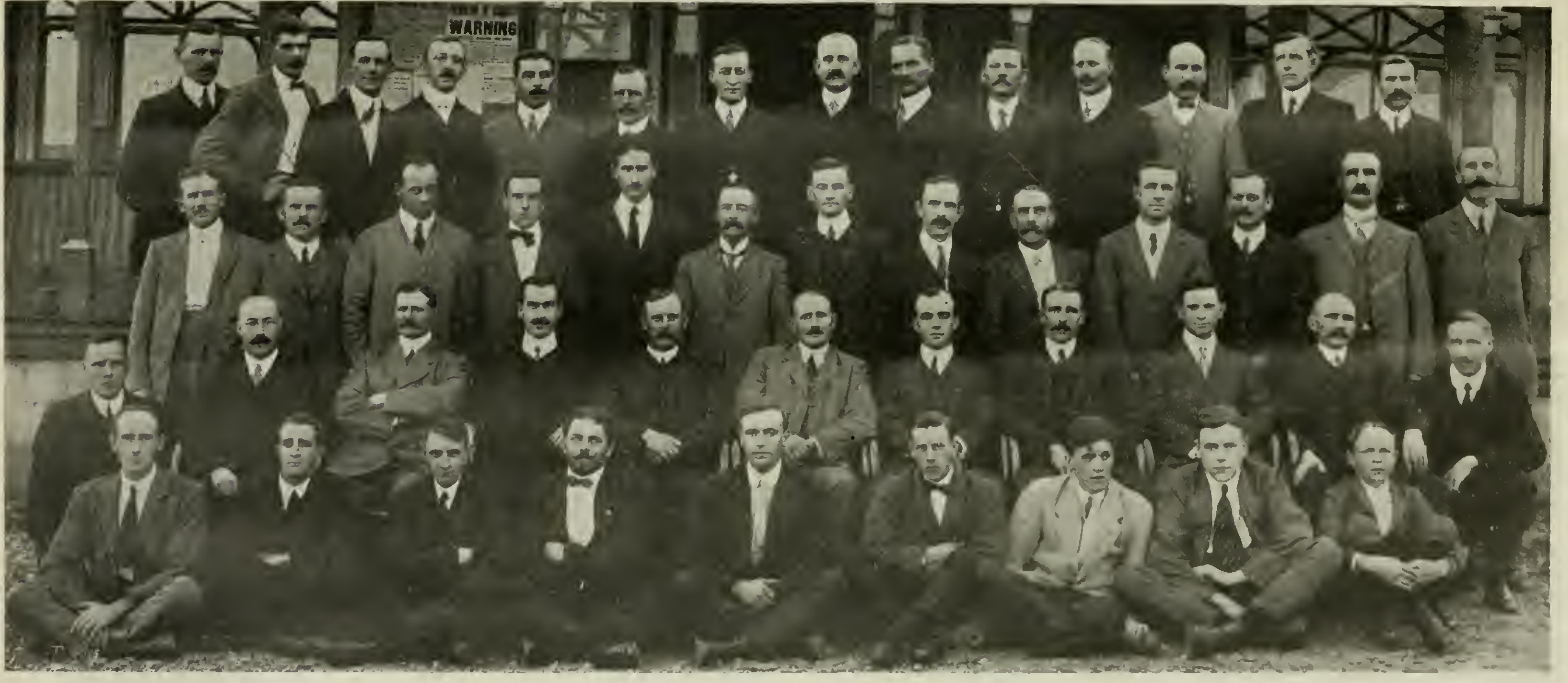
From Randfontein to Geduld the past year witnessed uninterrupted advance in the metallurgy of the auriferous conglomerates, and it may be added that the first four months of this year have witnessed a continuation of the onward journey towards the *ultima thule* of metallurgical and engineering endeavour. This much is certain, that if the underground side of the industry has failed to adequately respond to the anticipated influences of centralisation and the big mill scheme, the mills themselves and their technical corollaries have not proved economic disappointments to their sponsors.

Pure Compressed Air for Mines.

The usual quarterly meeting of the Association of Certificated (S.A.) Mechanical Engineers (Mechanical and Electrical) was held on Saturday evening last, Mr. J. Q. Braidwood, vice-president, in the chair. The work of the Council for the past three months was reported, and, further, one of the important matters discussed was the lubrication of the compressed air cylinders used on the Witwatersrand. It was maintained that considerable quantities of harmful carbonaceous matter was liberated when the high flash point oil was used, and the air containing these impurities was liberated at the rock drills and pumps worked by compressed air, while the miners were at work. It was generally agreed that better lubrication could be obtained at much less expense to the mines by the adoption of oils having a lower flash point than that now demanded by the Government Mining Department, and that the use of such better oil would result in pure air and greater efficiency. The adoption of the "high flash point oil" was a "scare" movement after several explosions had taken place in air compressors, but as the regulations now in force required the necessarily stringent hourly inspection of the temperatures of various parts of air compressors, the necessity for oils having a high flash point no longer existed. It was therefore unanimously agreed to apply to the Government Mining Engineer to allow the use of better lubricants, which while being cheaper were more efficient than those now demanded under the Mining Regulations, and would not deliver carbonaceous matter to the air mains or parts connected therewith. The hon. secretary, Mr. Kenneth Austin, was instructed to take up the matter with the Mines Department to endeavour to get a new rule included in the Mining Regulation Amendments, whereby better lubricants could be used than is now possible.

The best "Reef Traveller" is the *South African Mining Journal.*

THE MANAGER AND STAFF OF THE WITWATERSRAND G M. CO., LTD.



Reading from left to right :—

Top Row : W. C. Annand (Mine Captain), R. Flynn (Shift Boss), H. S. Isaacs (Shift Boss), W. M. Conochie (Store Clerk), P. M. Garrington (Native Timekeeper), K. R Christie (Foreman Drill Sharpener), F. R. Liddle (Battery Foreman), F. W. Hadfield (Superintendent, Native Hospital), J. P. Hansen (Electrician), W. Bayliff (Mine Captain), F. W. Bray (Foreman Fitter), F. Trudgeon (Shift Boss), T. Curnow (Foreman Crusherman), T. H. Cox (Shift Boss).

Second Row : E. G. Harpur (Shift Boss), A. Curnow (Assistant Storekeeper), C. S. Jamieson (Cyanide Foreman), K. Richardson (Assistant Surveyor), E. Guy (Sampler), S G Foster (Storekeeper), T. C. L. Howard (Assistant Assayer), W. Davies (Foreman Fitter), J. Garner (Foreman Boilermaker), F. J. Ralph (European Timekeeper), J. Jones (Foreman Carpenter), D Lyon (Foreman Blacksmith), R. H. Green (Assistant Mine Secretary).

Third Row : J. B. Nash (Assistant Manager's Clerk), L. B. Bawden (Assayer), P. T. Morrisby (Cyanide Manager), J. Reid (Mine Secretary), H Hosking (Resident Engineer), F R Lewis (Manager), G H. Beatty (Assistant Manager), H. S. Candy (Battery Manager), H. Freedman (Mine Surveyor), T. Milfull (Mine Captain), W. A. Webster (Assistant Native Timekeeper)

Bottom Row : M. G. Prosser (Assistant Surveyor), C. R. Pitts (Clerk), W. McPherson (Assistant Native Timekeeper), T. J. Crosse (Mine Captain), B. D Trethewey (Assistant Sampler), A. M Law (Assistant Sampler), W. J. Read (Assistant Sampler), R. C. Stables (Assistant Sampler), W. Couling (Junior).

DIAMONDS NEAR THE PILANDSBERG.

A Vast Volcanic Centre Beyond Rustenburg—Complex Geological Structure of the Area—The Need for Careful Investigation.

An interesting discovery of diamondiferous ground is reported from the Pilandsberg, and the usually quiet town of Rustenburg is said to be the scene of extreme excitement. The precise nature of the discovery is not quite clear from the information to hand, and we are therefore uncertain whether kimberlite has actually been found, or whether the presence of diamonds merely has been substantiated. The geological features of the neighbourhood, as described by Dr. W. A. Humphrey in a recent report of the Geological Survey, make it not unlikely that a pipe exists in the neighbourhood, for the locality in question has been the centre of some extensive volcanic outbursts, and it would not be surprising if some of the ultra-basic magma which is associated with the occurrence of diamonds, and which must have been widely spread below the crust of South Africa in comparatively late geological times, should have been to some extent involved in the outbursts of the Pilandsberg. The whole surrounding country is covered with igneous rocks, according to Dr. Humphrey. They belong partly to the igneous complex of the Bushveld, and partly to the alkali series of rocks which constitute the mass of the Pilandsberg itself. The most westerly development of the Red Granite is found here, while further to the west of it are to be seen the more basic modifications of the magma which are characteristic of the peripheral portions of the Bushveld laccolith. Thus the eastern part of the area under review is covered to a great extent with granite rocks, while in the western portion norite and pyroxenite types are found.

The Pilandsberg Volcano.

Against the extreme western edge of the Red Granite, and surrounded on the greater part of its circumference by norite and pyroxenite, rises the mountain mass of the Pilandsberg. It consists of a series of holocrystalline, dyke, and effusive rocks of two main types. One of these comprises plutonic and effusive varieties rich in soda and having nepheline and aegirine as important constituents. The other type consists principally of alkali-felspars in which neither nepheline nor aegirine is common, being generally entirely absent. Upon close examination these rocks are seen to be part of the very much denuded remnants of a great volcano, with a central core of plutonic material surrounded by a massive development of lavas and porphyrites, in which the dip is almost invariably from the central portion towards the circumference. An outer rim of plutonic rocks similar to those forming the central portion has been laid bare by the denudation of the overlying lavas, the original extent of which, Dr. Humphrey observes, must have been vastly greater both in height and area covered than is seen to-day.

Volcanic Breccia and Kimberlite.

In connection with the reported discovery of diamondiferous ground it is of interest to note that upon the farms Vaalboschlaagte and Houwater, where the discovery is said to have been first made, the effusive rocks, or lavas, are said to reach their greatest development. Among these effusive rocks are breccias, also, and a remarkable series is said to be developed around the northern and eastern edges of the Pilandsberg. Upon the farms mentioned, therefore, the existence of considerable quantities of this breccia is probable, and this leads to the idea that possibly here, as well as in the neighbourhood of the Derdepoort, Bleloch, and Kumst diamond properties, kimberlite may be found associated with masses of breccia, which are of no economic value whatever. Where the kimberlite masses are sufficiently large and rich enough mining may be carried on with profit. The occurrence of patches of what is called "mine ground" in circumstances such as these is liable to misinterpretation, and masses of volcanic breccia of vast extent may be spoken of as diamond pipes whereas they are merely an aggregate of isolated bodies of kimberlite surrounded laterally, and possibly in depth also, by large masses of other rocks. Already, for instance, the Premier is said to have been eclipsed, as far as superficial dimensions are concerned, by discoveries made near the Pilandsberg. The geological field which is composed of the volcanic and effusive rocks of this locality, is one which will probably require a great deal of careful and minute investigation before anything very definite can be said about the structural characteristics ot any diamondiferous body that may be discovered.

Age of the Pilandsberg.

All the available evidence goes to show that the age of the volcanic mass of the Pilandsberg is later than the Waterberg period. A space of time sufficiently long to have sufficed for the complete denudation of the sedimentary rocks above the Bushveld laccolite appears to have intervened after the intrusion of that mass, before the volcanic rocks of the neighbourhood were extruded. The lavas are in no way similar to those of the Drakensberg and there is no evidence available by means of which they may be compared in age with those of the Karroo. Beyond saying that they are post-Waterberg, therefore, no statement as to their age can be ventured upon.

SURFACE COSTS ON THE RAND.

The Cost of Management on the Mines—Expenditure upon Technical and Clerical Work—Figures for 1909 and 1912.

In December, 1909, there were on the Witwatersrand mines 82 managers and 25 assistant managers, while in December, 1912, there were, on the same mines, 69 managers and 29 assistant managers. Although the number of managers was decreased considerably during the intervening period, as a result of amalgamation schemes, the number of assistant managers was increased. In other ways, also, the technical and clerical staff of the mines was augmented, so that at the end of the period under review there were 2,481 persons under these headings as compared with a total of 2,290 at the beginning of it. The amounts paid in salaries and wages for the year ended June, 1910, and December, 1912, respectively, were £1,051,970, and £1,065,284, but since a certain amount, not definitely stated in the Government statistics, has to be deducted from the latter sum for medical officers' salaries, it may be taken that the account in each case is practically the same. The policy of amalgamation, therefore, has not affected the aggregate overhead and aboveground costs to any extent worth mentioning.

The technical staff at the end of 1909 numbered 1,222 and the clerical staff 1,068, a total of 2,290; whereas at the end of 1912 the numbers were 1,270 and 1,211 respectively, making a total of 2,481. In spite of the fact that the clerical branch of the administration increased so largely compared with the technical side, the consequent expenditure was greater in the latter department, the additional sums incurred per annum being £30,940 in one case and £35,869 in the other. The cause of the increase in the technical salary account is partly explained by the fact that mine overseers, who numbered 156 in 1909, were as many as 171 in 1913. Other increases were in the samplers and assayers branches. A somewhat remarkable circumstance is the diminution in the number of electrical engineers, from 49 to 48, whereas an increase might have been anticipated as a result of the wholesale electrification of plant that has been in progress for some months past. This decrease is not to be explained by the fact that mechanical engineers have qualified themselves for electrical work, because the number of these, also, has been reduced, over the period mentioned, from 100 to 87. The principal feature of all these changes has been the widening of the area of managerial responsibility by the employment of a larger number of assistants in various grades. In addition to assistant managers and mine overseers, for instance, there have been many more shiftbosses added to the mine staffs, as may be seen from the official statement that where there were 436 of this class in December, 1909, there were no fewer than 520 in December, 1912. The wages of these employees are not included in the figures quoted above, inasmuch as they come under the category of mine workers.

Fewer Mines, Bigger Office Expense.

In order to show how far the technical and clerical element preponderates in comparison with the mine worker, in the matter of salaries and wages earned by each class, it may be pointed out that while the number of separately managed concerns has decreased by about 20 per cent., the quantity of rock milled has increased by about 30 per cent., the total cost of salaries has remained unchanged and the cost of white underground labour has increased by only 10 per cent. Obviously one might have expected a distinct decrease on the one hand and a somewhat larger total upon the other. Salaries represent supervision very largely, whereas wages only partly represent it. If an addition of 30 per cent. in the quantity of the ore milled results in an increment of only 10 per cent. in the cost of underground labour, there seems no justification for the fact that the 69 present separate managements should cost more than the previous 86 on a similar output basis.

No account is taken in these remarks of the head office charges, which are to be superadded to those of the mines, and which, if presented on similar comparative lines, would probably emphasise our view that as regards economy on the administrative side the policy of amalgamation has not been strikingly successful.

UNION MINERAL RETURNS FOR MARCH.

Gold, Coal, and Base Metals—Total Yield: £3,652,101.

According to the Government returns issued during the week, the mineral output of the Union for March (excluding diamonds) was of the total value of £3,652,101, as against £3,395,773 for February, an increase of £256,328. The details for March are as follows:—Gold, £3,365,029; silver, £10,523; coal, £178,703; base minerals, other than coal, £97,846; total value, £3,652,101. The output of diamonds is published half-yearly.

GOLD.

The following table shows the number of mines working in the various districts declaring gold, and the district outputs for March:—

District.	No. of Mines.	Stamps at work.	Tube mills at work.	Output, Fine Gold. Ozs.
Witwatersrand	57	9,465	276	760,317
Heidelberg	4	110	2	7,382
Klerksdorp District	3	60	2	2,652
Ottoshoop	1	5	—	22
Pretoria	—	—	—	51
Barberton District	11	192	3	6,828
Pietersburg	3	30	—	436
Pilgrims Rest	11	147	6	14,491
Total for Transvaal ...	90	10,009	289	792,181
Cape	—	—	—	3
Natal	—		—	10
Totals for Union	90	10,009	289	792,194

COAL.

The following is a summary of the operations of the coal mines during the month:—

District.	No. of Collieries producing.	Tons mined.	Tons Coal sold.	Value per Ton. Pit's mouth. s.	d.
Springs-Brakpan	5	60,742	13,984	5	2
Middelburg	15	353,018	309,012	4	3
Other districts	10	63,790	60,559	3	10
Transvaal totals ...	30	477,550	413,555	4	3
Cape	9	6,601	5,331	11	4
O.F.S.	5	56,318	47,202	5	6
Natal	23	319,982	247,690	5	11
Totals for the Union	67	860,451	713,781		

COPPER AND TIN.

The following is a statement showing the output of copper and tin for March:—

Copper.

	Output. Tons.	Shipments. £
Transvaal	332	11,433
Cape	1,367	25,163
Totals for Union	1,699	36,596

Tin.

	Output. Tons.	Shipments. £
Transvaal	271	44,530
Cape	—	—
Totals for Union	271	44,530

OTHER MINERALS.

Sales and shipments of minerals other than gold, coal, copper, and tin during the month were:—

	Tons.	Value. £
Asbestos	71	1,375
Graphite	3	138
Magnesite	33	91
Lead	—	—
Zinc	—	—
Lime	7,284	14,786
Flint	50	333
Miscellaneous (mica, corundum)	—	—
	Ozs.	
Silver in gold bullion	84,614	10,523
Silver in other minerals	—	—

Rezende Mines.

Particulars of output for the month of March, 1913, showing a total profit of £2,435, made up as follows:—Rezende Section: Tons milled, 3,900; total ounces fine gold recovered, 1,535; estimated value of yield (gold and silver), £6,571; estimated profit after deducting London expenses, £1,486; add revenue from tributors, £585; estimated profit from Rezende section, £2,071. Penhalonga Section: Tons milled, 4,700; total ounces fine gold recovered, 897; estimated value of yield (gold, silver and lead), £4,482; estimated profit after deducting London expenses from Penhalonga section, £364; total estimated profit, £2,435.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Rand Metallurgy.

To the Editor, *South African Mining Journal.*

Sir,—It is very nice of "Rand Metallurgist" to state that I "am a great advocate of Butters' filters and zinc dust precipitation." I trust Messrs. Butters and Merrill endorse your correspondent's views. As for his remarks concerning the Consolidated Gold Fields and Dr. Caldecott, I fear "Rand Metallurgist," whose kindly comments I much appreciate, has overlooked my opening remarks in a previous review (1909). I would reproduce them, but the subject has already demurred that they were too appreciative; modesty and merit do thus go hand in hand. But I confess myself at a loss to understand the reference to my suggested lack of favour for the Caldecott table. If "Rand Metallurgist" will re-read my remarks he will see that I accuse the table of furnishing one of the best products for cyaniding ever fed into a vat, and also of the further advantage over its competitors of delivering a product so dry as to make draining the vat or some intermediate step unnecessary. Is "Rand Metallurgist's" letter a joke, or is it that he does not mention what is really in his mind, which may possibly be that I dubbed some one else the "doctor" of the field? By "doctor" I meant some one who takes hold of a plant distinctly an invalid and restores it to perfect circulation and vigorous health. I have yet to learn that any of Dr. Caldecott's plants need the advent of a physician or are other than most highly efficient.—I am, etc.,

ALFRED JAMES.

2 Broad Street Place, London,
8th April, 1913.

West Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—Replying to the article in your paper of the 12th April, I beg to state that Dr. Mellor's maps concerning the West Rand, which were published lately in your *Mining Journal*, are, in my opinion, not as they should be, because how can a man follow up the Rand formation given thereon, if he has no boundary lines and beacons of the farms to go by? You yourself state that the Carpenter series of reefs is not indicated on our map, but the inlier in which they are to be found on the western side is doubtless that circular space which appears to the left of the West Rand fault on Dr. Mellor's map. May I ask, is not your explanation also sufficient to prove that Dr. Mellor's map is incomplete? Further, Dr. Mellor marks this West Rand fault on top of the dolomite and Black Reef sheet, which fault he believes to be below this sheet although he has no reason for doing so, but it supports his theory for the present; but in my opinion a theory without facts is no theory. Therefore, under such conditions, with an incomplete map you must agree with me that it is very difficult to carry on discussions with regard to same. I may further mention for your information that we have three series of reefs on Waterval with a remarkably clean contact between the lowermost pebble bed on the underlying shale. Re Main Reef series on the West Rand: I have said that the Penwith Reef series are overlying the Government Reefs, therefore the Penwith must be Main Reef series as generally assumed by our experts: still on the Central Rand in a cross section through Johannesburg the Government Reefs are missing, which I always contended. Some time back you measured the Penwith series of reefs and published the section in your *Mining Journal*, and at the time you were quite convinced that this section was a true Main Reef section. In reference to my four questions put to geologists and your answers thereto, I beg to reply as follows:—(1) Why are the dolomite and Black Reef series conformable to each other and unconformable to the underlying Rand strata? Your reply is: Because the dolomite and Black Reef are of much later age and were laid down after considerable movement had intervened. Here I beg to differ from you. Your contention is that the dolomite with Black Reef were laid down after the Rand strata was in its position. How can that be? Our dolomite is taken far as a deep sea deposit up to 5,000 feet, and our Rand strata is up to about 25,000 feet in thickness, and they are unconformable to each other. I shall have to quote here the Channel Theory laid down by our experts. One eminent geologist says: That a deep sea existed when the Hospital Hill series were deposited but not when the conglomerates were laid down. At that time a subsiding movement could have existed. A tidal current could sweep over a channel of many miles, and although the transporting and eroding energy would extend to a depth of more than 500 feet, far greater energy would be developed in shallow waters. Now you will notice that this geologist left no room in his calculations for the Upper Rand strata, dolomite and Black Reef formation to bring them into the channel, the dolomite he had to get in by hook or by crook on account of its being a deep sea deposit. Unfortunately for the Channel Theory, he had to leave the Upper Rand strata dolomite with Black Reef formation out of the channel to form his Main Reef series, and this is in my opinion the reason why a great number, if not all our experts, do not know how our dolomite and Black Reef sheet came into existence overlying unconformably our Rand strata. I may further mention re the Channel Theory that the supposed rivers and spruits leading into the channel had to bring down into the same the material for building up our Rand strata, after the Main Reef series were laid down very nicely the channel was full of material. But say, for instance, there was still room in the channel to get the top Rand strata in, then in such a case the rainy seasons had to cease for millions of years, or the rivers and spruits had to be dammed up not to let any more Rand strata material come down in the channel at the time when the 5,000 feet thick bed of dolomite was laid down. Now can you imagine that Nature would have assisted at that time our coming geologists in damming up these rivers and spruits, to put forward to us this famous Channel Theory without facts? I say no. What a hope! (2) Why are the dolomite and Black Reef series conformable to the old granite when found in contact with same? Your reply is: They are not geologically conformable. My answer thereto is that in practice they are conformable and even more than that, and my advice is, if you can spare the time take your hammer and get on to Brackfontein to Mr. Erasmus's werf, 8 miles south of Pretoria, where you will get all the information wanted in connection with my question, if you go carefully to work. (3) Why has every series of reefs its own separate dykes, faults and breaks, which are in no way connected with underlying reefs at a lower horizon. I have in mind in this connection the interbedded dykes. Take, for instance, the South Reef dyke on the Rand: this very dyke as far as we know to-day has no connection with the underlying strata of the Main Reef series and is also not connected with the footwall strata of the Kimberley series of reefs, but always keeps to the South Reef series. (4) By what forces were our different Rand beds pushed with an unconformity towards the Graniteboss? Your reply is: The generally accepted opinion is that the Graniteboss was thrust against the Rand beds. Here, also, I beg to differ from you. Our Graniteboss north of Johannesburg is considered by our geologists to be older than our Rand strata, and I think there is very little doubt about that. Now how is it possible for the Graniteboss to bring about this unconformity between the dolomite with Black Reef sheet and the underlying Rand strata, and again between the different Rand beds. Prof. Molengraaff also knows that the Rand beds were pushed towards the Graniteboss, but has given no reason yet how it happened. I may mention here that the key to our Rand geology is the dolomite, and the question is how it came to be where it is now found. It takes time and labour to find out the true position of the dolomite. In my opinion the questions are well worth looking into, and if rightly answered will not only throw light on the matter of the dolomite, but also on the much discussed Rand system.—Yours, etc.,

E. KUMST.

Transvaal Bank Building,
Johannesburg, 23rd April, 1913.

[The maps referred to were taken from a general map used by Dr. Mellor to illustrate his views at a recent meeting of the Geological Society. Since then a detailed map has been published which can be obtained from the Secretary of the Society. This detailed map confirms our statements with regard to the Carpenter series. Dr. Mellor's theory relating to the West Rand fault has many cogent facts to support it as will be seen from a perusal of his paper upon the geology of the West Rand. The section on the Penwith is remarkably like a Main Reef section in several ways; the shale contact has always been a stumbling block, however, until the results of the survey have left little room for further doubt that the section is a Government Reef section. Mr. Kumst's criticism of our replies to his categorical queries, and his views about the "Channel Theory" and other geological matters reveal a want of knowledge of elementary geological facts.—Ed., *S.A.M.J.*]

Blaauwbosch, adjoining Rooiberg Minerals, is now being worked. The property of the Olivienbosch Tins has suspended operations.

Mining Exhibition—Special Supplement.—II.

Detailed Description of Leading Exhibits.

Messrs. Head, Wrightson & Co., Ltd., have on view a model four-stamp Nissen battery, a "Nota Nos" stope ore conveyor, and a Hendryx agitator. The firm draw attention to the fact that the Nissen stamps, as manufactured by them, represent the gravity stamp mill in its simplest form, being a complete unit in itself. These stamps are installed in tin mines in South Africa and Cornwall. In an interesting booklet, on high duty gravity stamp mills, the excellent features of the Nissen stamp, and its advantages over the multiple stamp, are fairly dealt with, and its claim to consideration, over other types of gravity stamps, is established by its use in (1) a saving in power ranging from ·8d. to 1·0d. per ton of ore milled; (2) reduced maintenance expenditure; (3) reduced capital expenditure. The "Nota Nos" stope conveying machine has for its object a reduction of lashing costs by dispensing with the large number of boys required to shake the long lengths of swinging chutes conveying the rock down the stopes.

* * * *

The Denver Rock Drill Company, whose motto is "The recollection of quality remains long after the price is forgotten," has staged two models of the Waugh air-feed drills for stoping, raising and box holing. The wide recognition accorded these hammer drills set aside any occasion for comment here. A speciality of this firm is the "Duxbak" waterproof leather belting on exhibit. Many users of this material claim it to be proof even against machine oil, and certainly its resisting qualities in this respect cannot be denied. Conveyor belting, rock drill hoses, packing and air meters are also on exhibit by the firm.

* * * *

The Flottmann Engineering Company, manufacturers of rock drills and other mining requisites, have on view a shaking chute motor, of which there are some 2,500 in use. This apparatus is made in three models: the double column bar type, for shaking hanging chutes, 100—400 feet; single column bar type, for swinging hanging chutes, 50—200 feet; and the universal type for hanging and rolling chutes. They are also exhibiting reciprocating rock drills and hammer drills of various sizes, a steam hammer drill, a cradle machine and a drill with air feed, etc. The Flottmann exact air meter for testing air consumption of rock drills has attracted considerable attention, as also have the "Thor" drills exhibited by the firm.

* * * *

Messrs. A. D. Bleichert & Co., manufacturers of aerial ropeways, cableways, conveyors, haulage plants, etc., are exhibiting on the north-eastern wall ten excellent pictures illustrating the variety of uses to which the firm's manufactures are applied. One picture shows the transport of timber in German East Africa over an aerial ropeway of six miles. An equally interesting view depicts the transport of complete mine cars by means of an aerial ropeway in Germany. A passenger ropeway in use in the Tyrol, for cars conveying 16 passengers, is also presented. A dumping bridge for automatic disposal of tailings, Brakpan Mines, and an electric telpher plant for the transport of pebbles, Randfontein Central, are among other pictures illustrating the uses of this form of transit locally. Others are a dump bridge for automatic disposal of slag, storing ore on shore and transporting it to a vessel, the loading and discharging terminals of a ropeway, Barberton, etc., subjects of constant interest to numbers of visitors to the exhibition.

* * * *

On Messrs. Bartle & Co.'s stand a wide range of mining requisites is displayed, of which detailed mention is impossible in the space at disposal here. Prominent, however, among the exhibits are the Cleveland rock drill, the Eagle rock drill, and Simplex rock drill bits and holders; the Thomas patent washer; Bartle's patent cam shaft wedge; McAdam's patent valve for sands; McVitty's reversible metal guide block; John Pooley & Son's scales of different sizes; patent "Lumley" washing machine; mechanical and electrical hauling device (Phillips' patent); new British hand speed drilling machine; general fire appliances; the Woodhead screwing machine; registering pyrometer; boss hose connection; fuse exploder; Davies' time detectors; anemometers; hygrometers; aneroids, and pocket slide rules; tachometers; pneumatic tools; patent sprays of various kinds; patent hot speed for saving air; the "Gribble" telescopic rock drill bar; safety lamps, etc. The firm are also sole agents for the Chewee mill for crushing and grinding ore and rocks, and have introduced many improvements in stamp batteries. A magnificent collection of steel tools is also exhibited on this stand, the manufacture of the Attercliffe Steel Works, Sheffield, England. The firm have, in addition, displayed specialities in wire ropes of all sizes.

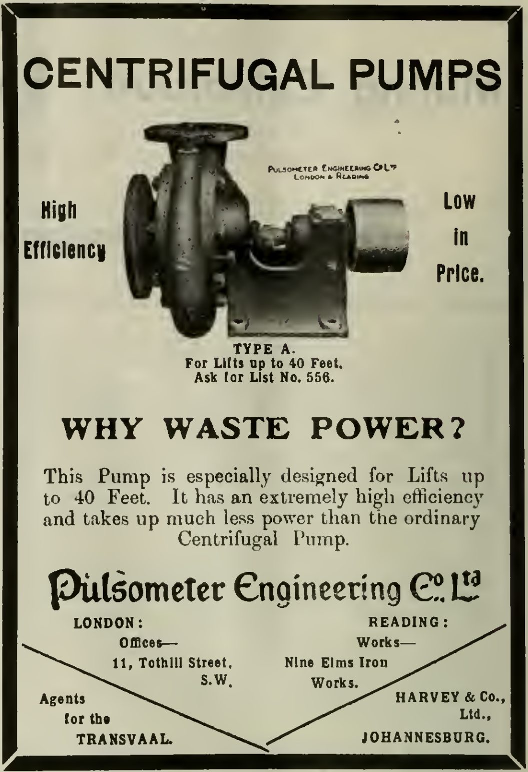
Cir-Dia-Meter.

This simple but ingenious little instrument, invented by Messrs. J. H. Hughes and E. J. Hayward, both of Johannesburg, fulfils a long-felt want on these fields and the world in general. By the use of this instrument the diameters, circumferences and the amount of wear in ropes may be accurately and instantaneously found without having recourse to the present laborious method of winding a piece of twin around the rope ten times and then calculating the diameter and circumference from the length thus obtained, which method is always liable to miscalculation. The flattening out of the rope may also be immediately noticed by its use. For engineers, fitters, turners, rolling millers, ropemen, etc., it is invaluable, and especially in lathe work where the size of a piece being turned can be read instantaneously without the use of callipers. In inaccessible places the instrument may be locked and the reading taken afterwards at leisure. For fitters the depth of keyways, etc., may be read without fear of error. The instrument as exhibited is guaranteed accurate to 1/100th part of an inch or millimetre, and for very accurate work may be made to read to 1/1000th of an inch. The sole agents are Messrs. Power & Greatrex, 7 and 8 Bettelheim Buildings, Johannesburg, from whom full particulars may be obtained and where the instrument can be seen.

The Making of Fireclay Goods.

A NEW INDUSTRY.

Mr. M. Donovan, of New Clare, has started a new industry in conjunction with his brick and pottery production, viz., that of fireclay goods, as follows:—Fire bricks: Ordinary hand-made; slop pressed; salt glazed; arch, side arch and end arch; bull nose and splays; springer bricks, and ends and sides; soaps, 9 x 4½ x 1in., 9 x 4½x 1½in., 9 x 4½ x 2in.; slabs from 12in. upwards, and blocks made to size required; baffles of every description; crucibles (orders will be executed shortly); muffles and liners; stove bricks made to any model; ground fire clay; klompies in fire clay; circular fire bricks for chimney building. The clay has been analysed, and the report is excellent. The essential qualities of a fireclay are that it must be (1) plastic, (2) infusible, (3) refractory. The purest form of clay is kaolin, a hydrated silicate of aluminium. It is remarkable, however, that absolutely pure kaolin is not very plastic, but that a very small percentage of certain other chemical substances increases this plasticity. In the matter of withstanding the action of basic slags and furnace gases, kaolin is unequalled. Clays containing in their composition free silica become corroded more easily, for it is the silica that is readily attacked. The analysis of this clay shows it to be almost pure kaolin, with a very small percentage of other substances, which improve its qualities for commercial purposes. Having therefore such a clay in hand, it is possible to manufacture any kind of refractory fireclay article, whether it be muffles or the like, with high heat conductivity and perosity, or bricks for boiler furnaces capable of withstanding heavy strains and the action of furnace gases, but having a low heat conductivity. Clays which closely approach kaolin in composition are the only ones that fulfil such requirements, also for muffles and metallurgical uses. At the last Agricultural Show in Johannesburg he was awarded 18 points out of a possible 20, with first prize. In about two months' time he will be able to supply any class of fire brick. Orders may now be booked to supply in that time. In a month's time he expects to have a machine in operation for the manufacture of crucibles. We feel confident that this article can be manufactured in South Africa as good and perhaps better than the imported. It may be mentioned that all South African industries in their different productions are trying to produce articles equal to the imported and to save part of the great sums of money now being sent oversea. Mr. Donovan's address is P.O. Box 4, New Clare, Telephone No. 2.



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A comprehensive exhibit of "Climax" rock drills and hammer drills are being staged by Messrs. Wm. Hosken & Co., general mining merchants. The Imperial reciprocating rock drill of this type is intended for specially hard drives, weight 305 lbs. Light drills are also on exhibit for stoping, raising or sinking. There is also a patent dust allayer on view. The Climax drills are famous for the excellence of materials and construction, while embodying economy and durability in the highest degree. They are rapid drilling machines, with low air consumption.

East Rand Central Mines.

The eleventh ordinary general meeting of the East Rand Central Mines, Ltd., was held last week, Mr. Michael Dodd presiding, 56,387 shares, out of an issue of 151,340, being represented. The Chairman said: Reference has more than once been made to an agreement between your company and the Government, whereby your mineral area of 424 claims has been linked to the Government ground, representing the Brakpan Deeps. A second effort has been made to obtain lessees for the joint area. Tenders were to have been received by the 28th of February, but, owing, no doubt, to the disorganisation of the money market, caused by the disastrous European war, no tenders were forthcoming. We were consulted by the Government as to the wisdom of extending the time for receiving tenders to the 30th of June, and we agreed to do so. Whether the market by that time will be such as to assure tenders, it is impossible to forecast. The one thing which is very cheering is the fact that developments on the Brakpan Mines continue so satisfactory. The report was adopted.

Tell advertisers you saw it in the *South African Mining Journal.*

Rhodesian Section.

LATEST MINING NEWS.

The March Output—Eileen Allanah—The Cam and Motor's New Manager—Umniati Gold Fields—The Bell Mine—Globe and Phoenix Developments—The Labour Bureau.

Elsewhere in this issue we give full official details of the mineral output of Southern Rhodesia for the month of March, as published by the Chamber of Mines. The production constitutes a record, the output of gold being valued at £257,797, as compared with £208,744 in the preceding month, and £243,712 in August, 1911—the previous highest production. The production of other minerals brought the total value of the output up to £271,913. The increase in gold output is largely due to the declaration of an output of 4,764 " reserve " ounces, valued at over £20,000, by the Globe and Phoenix. In addition, this company returned £35,214 from the mill, £2,817 from concentrates, £2,652 from tailings, and £2,505 from slimes. The following table shows the value of the monthly and annual gold outputs of Southern Rhodesia since January, 1911, together with the value of the annual outputs of other minerals:—

Month.	1911.	1912.	1913.
January	£207,904	£214,918	£220,776
February	203,055	209,743	208,744
March	231,947	215,102	257,797
April	221,296	221,476	
May	211,413	234,407	
June	215,346	226,867	
July	237,517	240,514	
August	243,712	239,077	
September	225,777	230,573	
October	218,862	230,072	
November	214,040	225,957	
December	217,026	218,661	
Total gold ...	£2,647,895	£2,707,367	£687,317
Other minerals.	242,864	257,230	54,038
Total value ...	£2,890,759	£2,964,597	£741,355

* * * *

The five-stamp battery at the Eileen Allanah is being temporarily restarted. The object is to do some trial crushings in connection with the experiments that are being carried out under Mr. Marriott, the chief metallurgist.

* * * *

Mr. McDermott, the new manager of the Cam and Motor, has arrived at Gatooma, and after a brief stay at the mine will proceed to Salisbury to consult with the head office there. It is reported that Mr. Manners, the well-known constructional engineer, may come from England to supervise the erection of the plant at the Cam and Motor.

* * * *

Recent visitors to the Umniati portion of the Gatooma district state that that is undoubtedly the next place to become prominent in a gold mining connection. Some splendid finds have been made, and now that the rainy season is coming to an end there is conclusive evidence that prospectors will be very active.

* * * *

According to the Gatooma correspondent of the *Bulawayo Chronicle*, practical miners who are or have been associated with the Bell Mine at Que-Que predict that it must develop into the biggest proposition in Rhodesia, and their enthusiasm appears to be genuine. A new siding has been laid at the Que-Que Station, called the " Bell " siding, for the reception of the large and elaborate machinery for the equipment of the concern. A specially large set of " sheerlegs " have been erected, and it is stated that the construction of a light railway from the main line to the mine—a distance of seven miles—is contemplated.

* * * *

The following is a report on the development work at the Globe and Phoenix mine for March, 1913:—12th level, station reef: No. 1 winze south has advanced 23 feet; average width of reef, 8 inches; average value over 30 inches, 10 dwts. 12th level, north drive from main shaft: Prospecting has advanced 102 feet; average width of reef, 9 inches; average value over 30 inches, 1 dwt. 18th level, east portion No. 2a: Intermediate winze has advanced 22 feet; average width of reef, 23 inches; average value over 30 inches, 14 dwts. 18th level, east portion: Drive north from 2a winze has advanced 14 feet; average width of reef, 4 inches; average value over 30 inches, nil. 18th level, west portion: Drive north, footwall leader, has advanced 72 feet; average width of reef, 11 inches; average over 30 inches, 20 dwts. 18th level, west portion: Drive south, footwall leader, has advanced 61 feet; average width of reef, 18 inches; average value over 30 inches, 4 dwts. 19th level: Drive north from 2a winze has advanced 76 feet; average width of reef, 11 inches; average value over 30 inches, 4 dwts. 19th level, west portion: No. 1 winze north has advanced 33 feet; average width of reef, 19 inches; average value over 30 inches, 18 dwts. 19th level, west portion: No. 2 winze north has advanced 46 feet; average width of reef, 19 inches; average value over 30 inches, 79 dwts. Cross-cutting for month, 55 feet. Vertical shaft has been sunk a total depth of 741 feet. The ore reserves at 31st March, 1913, were 175,678 tons, average value 33·4 dwts., containing 293,383 ozs. fine gold.

* * * *

Presiding at the annual meeting of the Rhodesia Native Labour Bureau in Bulawayo the other day, Mr. H. W. Kempster, the retiring chairman, remarked of the future of the organisation: " The future of the Bureau must be largely interwoven with the two great industries of the country; and once more we are brought face to face with the fact that co-operation between these two industries is a real live necessity. It has been the greatest pleasure to me to see the harmonious relationship existing between the varied interests of the members of our board of management, and in my opinion this spirit has grown throughout the whole country; in which case I am confident that it will compel success in the future. I know how difficult at times it is to avoid a clashing of interests; but looking at it from a broad-minded point of view, one can only draw one conclusion: that after all, their interests are mutual, inasmuch as the mining industry is essential to the prosperity of the country; and, on the other hand, the prosperity of the farming community is equally important in connection with its sister industry. Now, gentlemen, in conclusion, I desire to offer my heartiest good wishes for the success of these two great industries; and as I am practically, after to-day, severing my connection with the Bureau, and shall no longer hold any executive position in connection with it (although I shall always take the deepest interest in its future), I may perhaps be allowed to say that I speak from a more than ever disinterested standpoint."

RHODESIA'S MINERAL OUTPUT FOR MARCH.

A Record Month—Gold, £257,797; Total Minerals, £271,913.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of March, 1913, with comparisons and values:—

GOLD.

Note.—All the declarations are in fine gold.

MATABELELAND.

Bulawayo District—	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value. £
Agincourt (H. L. Maidwell)	5	334	284.97	1197
Alice and Atlas (Est. R. Barkley, deceased) (tailings)	—	1152	101.38	426
Anchor (M. Morrison)	5	250	33.46	141
Anterior (W. J. Lane)	2	200	62.42	262
Do. (tailings)	—	130	17.73	74
Bangali (Hicks and Arbery)	5	100	22.81	96
Belmont (A. D. Hall)	5	150	152.81	642
Do. (tailings)	—	137	27.92	117
Big Ben (W. E. Hunt)	4	260	281.46	1182
Do. (tailings)	—	151	118.63	498
Blanket (Forbes Rhod. Synd., Ltd.)...	15	875	157.86	663
Blobs (J. P. McCay) tailings	—	—	.89	4
Blue Reef (J. Eisenhammer)	2	195	59.95	252
Bobs (Bobs Reef Synd.)	5	460	49.97	210
Do. (tailings)	—	400	10.51	44
Bushtick Mines, Ltd.	26 3T	6128	235.63	989
Do. (tailings)	—	3308	506.61	2128
Do. (slimes)	—	2883	324.49	1363
"C" (D. and C. Synd.)	10 1C	2352	124.46	523
Do. (tailings)	—	1991	199.19	837
Do. (slimes)	—	358	91.17	383
Champion (R. Aserman)	5	522	51.98	218
Do. (tailings)	—	289	34.16	143
Chokeford (C. & G.E. & F. Co., Ltd.)	(15 4P)	399	174.50	733
Do. (tailings)	—	200	20.00	84
Claremont Mines (Rhod.) Ltd.	20	2181	309.79	1301
Clean up (New Belingwe G.M. Syn.).	5	185	84.74	356
Cross (T. W. Angus)	2	80	15.99	67
Do. (tailings)	—	250	19.91	84
Dam (W. H. Robinson)	2	120	31.24	131
Eagle A (Macdonald & Co.)	5	549	223.46	939
Do. (tailings)	—	288	32.87	138
Farvic (H. S. Henderson)	5	285	161.18	677
Do. (tailings)	—	285	15.32	64
Flora (pannings) E. E. Beecroft	—	—	6.12	26
Fred (Trans. & Rhod. Est. Ltd.) ...	5	700	451.50	1896
Godwin (Barrett & Stacey)	5	250	94.74	398
Imani (E. Rochfort)	2	264	75.08	315
Kameel (New Rhod. M., Ltd.)	5	586	237.66	998
Koba (Koba Syndicate)	5	210	37.23	156
Limes (D. Vincent)	5	120	16.22	68
Lina (W. J. Cooper)	5	100	122.74	515
Lone Hand (Armstrong, Furber & Alexander)	5	571	213.63	1023
Lonely Reef G.M. Co., Ltd.	15 3T	4420	1506.56	6328
Do. (slimes)	—	4420	2714.47	11401
Matabele 3 (R. M. Nairn)	10	1338	433.35	1820
Do. (tailings)	—	945	51.87	218
Matabele Queens' Co., Ltd.	10	1500	480.89	2020
Do. (tailings)	—	1500	378.15	1588
Do. (slimes)	—	810	81.00	310
Mauretania (J. G. Habakkuk)	2D	15	4.93	21
Minnie's Luck A (Mrs. C. M. Reid).	5	170	29.45	124
Mystery A1 N (W. Souter)	2	180	14.89	63
Nelly (F. D. Roscoe)	2H	1030	533.73	2242
Do. (tailings)	—	570	38.07	160
New Eclipse (J. R. Stewart)	5	634	221.22	929
Do. (tailings)	—	170	33.00	139
Nita (J. Gardner)	5	680	67.24	282
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	1726	451.74	1897
Do. (tailings)	—	1063	253.75	1066
Penzance (R. Urquhart)	2	50	15.89	67
Do. (tailings)	—	50	14.30	60
Poort (R. McConville)	2	150	57.53	249
Premier (McKenzie & Bulement)... ...	2	200	32.89	138
Princess (C. A. Abbott)	2	180	46.67	196
Red Rose (C. G. Bancroft)	3	134	29.24	123
Do. (concentrates)	—	—	1.10	5
Riversdale (Bruhns & Schwarz)	5	475	109.65	460
Riversdale 2W (A. Fraser)	3	140	39.46	166
Riverside (R. Martindale)	2	80	30.51	128
Sport (J. R. Stewart)	(5)	16	14.27	60
Styx (Bazeley & Lock)	2	22	3.43	14
Susanna Mines, Ltd.	8	988	412.23	1731
Do. (tailings)	—	511	74.60	313
Teutonic (Hanover G.M. Synd., Ltd.)	5	801	296.91	1247
Tuff Nut (King's Synd.)	5	590	223.49	939
Do. (tailings)	—	310	12.96	54
Umvoti (Henderson & Toshack)	2	200	47.53	54
Up-to-Date (Cumings & Berry)	3	315	71.75	301
Do. (tailings)	—	354	73.56	309
Wanderer's Rest (Wheeler, Davis, and Rintoul)	5	527	334.86	1406
Xmas (M. Westerberg)	2	30	19.04	80
Bulawayo District Total			14,580.59	61,221
Gwelo District—				
Ardpatrick (C. Maleham)	3	298	106.33	447
Arizona No. 28 (L. R. Evans)	2	90	29.57	124
Beacon Hill 1 (R. Aserman)	4	142	217.12	912
Do. (tailings)	—	220	18.68	78
Bonsor (B 326) (Willoughbys) other sources	—	—	26.51	111
Bowie (A. Malcolm)	5	155	25.47	107
Bute (T. Pedlow)	5	60	14.25	60
Cinderella (P. Burt)	1E	425	39.44	166
Csardas (Wolfshall Syndicate)...	10	447	384.67	1615
Do. (tailings)	—	325	78.03	328
Do. (slimes)	—	122		
Empire Day (G. Black) (tailings) ..	—	300	32.33	136
Gaika G.M. Co., Ltd.	5 1C	3200	941.78	3955
Do. (tailings)	—	1381	52.02	218
Do. (slimes)	—	1200	161.87	680
Gartley (A. J. Grant)	2	63	45.15	190
Glen Rosa No. 1 (McIntosh & Lister).	2	146	28.69	120
Do. (tailings)	—	94	11.65	49
Globe and Phoenix G.M. Co., Ltd.	40 12P	6529	8384.56	35,214
Do. (concentrates)	—	198	670.70	2817
Do. (tailings)	—	3843	631.37	2652
Do. (slimes)	—	2322	596.54	2505
Reserve gold declared	—	—	4764.04	20009
Gretna Green (M. L. Price)	5	70	65.84	277
Invulnerable (A. E. West)	5	175	57.17	240
King's (P. S. Warden) clean up... ...	—	—	65.34	274
Moss (James & Morrisby)	2	287	226.14	950
New Dunraven G.M. Ltd.	5	750	155.21	652
Do. (tailings)...	—	600	25.75	108
North Bonsor (Cornish Syndicate) ...	15	2024	507.80	2133
Do. (tailings)	—	1085	116.14	488
Pompei (Pharos Synd.)	2	98	30.02	126
Do. (tailings)	—	200	5.86	25
Pretty Polly (New Rhod. R. Co., Ltd.)	5	100	50.22	211
Do. (tailings)	—	420	49.70	209
Red Hill Dev. Syn., Ltd.	1C	2307	45.42	191
Do. (tailings)	—	1210	83.73	351
Sceptre (R. & W. Syndicate)	1C	385	126.25	530
Do. (tailings)	—	260	25.09	105
Selukwe Columbia G.M., Ltd. ...	1C 3P	3100	1010.69	4245
Do. (concentrates)	—	130	138.90	584
Do. (tailings)	—	2044	314.50	1320
Do. (slimes)	—	1000	102.90	432
Do. (other sources)	—	—	125.65	528
South Bonsor (Ideal Synd.)	10	724	94.35	396
Tebekwe (A. N. Tyrrell)	10	1035	112.29	472
Veracity (J. Fischer) (slimes)	—	392	47.30	199
Wanderer (Selukwe) G.M., Ltd. ...	4GR	18720	1573.04	6607
Winston (J. Jones)	6	80	103.16	433
Gwelo District Total			22,519.23	94,579

Matabeleland Total ... ... 37,099.82 ozs.

Value £155,800

MASHONALAND.

Hartley District—	No. of Stamps.	Tons Treated.	Yield. Ozs.	Value £
Acorn Gold Mines, Ltd.	5	576	172.88	726
Do. (tailings)	—	380	55.94	235
Agnes (P. S. Triggs)	5	372	114.82	482
Baluarte (C. Tallon) tailings	—	50	2.55	11
Battlefields (Minaar & McArthur) ...	2C	1210	259.76	1091
Do. (tailings)	—	968	107.48	451
Do. (slimes)	—	242		
Blue Rock (Blue Rock Synd.	2	300	134.11	451
Do. (tailings)..	—	175	35.03	147
Brilliant (Mabel's Luck Synd.)	7	700	453.83	1906
Do. (tailings)	—	208	96.23	404
Butterfly (F. W. G. Richards) (tailings)	—	450	5.19	22

	No. of Stamps.	Tons Treated	Yield. Ozs	Value £
Cheshire Cat (Tavener & Duncan	5 1P	154	259.57	1090
Do. (tailings)	—	299		
Do. (slimes)		15		
Concession & W. Extension (C. F. Simpson)	5 1C 3P	2214	431.17	1825
Do. (tailings)	—	1630	101.90	431
Corsilla D. (Yellow Jack Synd.)	2	125	6.86	29
Do. (tailings)	—	70	6.26	26
Crown No. 2 (Crown Synd.)	2	150	25.12	106
Do. (tailings)	—	120	27.43	115
Dalny (Phillip Wiggins, Ltd.) (tailings)	—	520	60.79	255
Dalny 1W. (Shagari Mines, Ltd.)	5	300	49.09	206
Dalny 1N.E. (C. Tallon)	5	100	19.97	84
Dorothy No. 2 (C. H. Weldon) (tailings)		430	34.60	145
Dowry (P. A. Euke)	1 PN	350	59.02	248
Ebinezer (Spring, Spring & Paxton)	3	20	15.30	64
Eiffel Blue & E. Ext. (Willoughbys)	10	1101	501.09	2105
Do. (tailings)	—	840	67.68	284
First Venture A. (J. P. Carroll)	2	220	77.74	327
Do. (tailings)	—	165	40.81	171
Giant Mines of Rhodesia, Ltd.	30 2T	14556	3345.70	14061
Glasgow Mines, Ltd.	5	702	97.11	408
Do. (tailings)	—	330	61.80	260
Glencairn No. 3 (Glenrosa Synd.)	1	108	261.44	1098
Do. (tailings)	—	207	14.86	62
Globe (E. J. Davies)	1H	275	31.29	131
Golden Valley (J. Mack)	10	1076	165.22	694
Do. (tailings)		350	33.17	139
Goldmore (H. B. Gibbons)	2	100	68.93	289
Juno (H. R. Nicholl)	5	355	93.83	394
Kanyemba (Kanyemba Synd.)	5	354	448.48	1881
Do. (tailings)	—	224	102.00	428
Kyrenia (J. Mack)	5	144	12.68	53
Do. (tailings)	—	160	6.42	27
Luke (Luke Synd.)	3	60	26.30	110
Nada (G. H. Fison)	1PN	52	20.20	85
New Milky Way No. 3 (J. Mack)	5	504	65.47	275
New Union Jack (S. A. Beach) tailings	—	140	17.31	73
Oleander G.M. Co., Ltd.	3	275	115.94	487
Do. (tailings)	—	115	53.99	227
Do. (slimes)	—	160		
Owl (A. Rolfe)	10	1361	517.38	2173
Do. (tailings)	—	870	142.87	600
Pickstone Gold Mines, Ltd.	12	780	528.73	2221
Do. (tailings)	—	546	158.20	661
Rosberville (J. Tilbury)	—	—	6.81	29
Rover & Early Bird (S. H. Coker)	2	51	21.15	89
Do. (tailings)	—	60	7.00	29
Seigneury (N. A. Arnold)	5	119	112.41	472
Do. (tailings)	—	360	22.51	95
Shepherds (Phoenician (Rhod.) Co., Ltd.)	5	590	318.56	1338
Do. (tailings)	—	258	185.72	780
Sid (Sebakwe & Dist. Mines, Ltd.)	5	675	281.29	1181
Do. (tailings)	—	1105	131.81	554
St. Oliven No. 4 (Yellow Jack Synd.)	2	308	105.43	443
Tea (Cent. Min. & Invest. Corp., Ltd.)	5	890	172.72	276
Do. (tailings)	—	315	56.52	237
Thistle-Etna G.M., Ltd.	1C	3650	938.88	3943
Do. (tailings)	—	2805	147.85	621
Do. (slimes)	—	675	51.73	217
Try Me 2 (R. R. Aitkin)	5	350	163.99	689
Warthog (C. Davidson)	5	28	16.52	69
Washington (I. J. Minaar)	5	475	399.20	1677
Do. (tailings)	—	400	47.72	200
What Cheer (H. Moser)	5 1H	850	115.34	48.
Hartley District Total			12,890.79	54,278
LOMAGUNDI DISTRICT—				
Alluvial (R. G. Harding)			36.56	153
Eldorado Banket G.M. Co., Ltd.	20 2C 8P	7592	3351.95	14215
Do. (tailings)	—	7768	960.43	4073
Linnett (A. L. R. Morkel)	2	717	141.39	594
Lone Hill (Moll & Platt)	2	206	47.79	201
Ventura (Stone & Standen)	2	196	44.25	186
Lomagundi Total			4,582.37	19,422
MAZOE DISTRICT—				
Authentic (Mrs. Adamson) (tailings)	—	400	17.22	72
Commonwealth G.M. Co., Ltd.	(30)	300	31.72	135
Do. (tailings)	—	192	20.41	86
Do. (slimes)	—	108	8.11	34
Dunstable (J. Strachan)	2	147	38.63	162
Goth (Goth Syndicate)	2	112	38.07	160
Honest (G. Brown)	3	108	37.16	156
Jumbo G.M. Co., Ltd.	30	3200	599.32	2517
Do. (tailings)	—	2018	380.39	1617
Do. (slimes)	—	1152	153.76	653
Mitre 8 (Bishop's Synd.)	1D	11	26.27	98
New Found (D. H. Curry)	5	235	142.05	597
Pompei A (R. Ricardo)	5	158	48.27	203
Thornhill (Oceda G.M. Co., Ltd.)	3	770	136.29	572
Do. (tailings)	—	734	42.54	180
Tom Cat (Monarch (Tati) G.M. Synd.)	1Pn	422	149.79	629
Umkulu DB 1W (Llahsram Synd.)	2	[illegible]	53.06	223
Mazoe Total			1,929.12	8,121
SALISBURY DISTRICT—				
Elsinore (J. Reynolds)	1D		5.17	32
Genesis (Bates & Levy)	3	120	10.27	43
Hopefield (Hopefield Syndicate)	2	264	170.06	714
Do. (tailings)		264	53.12	223
Inyague 3 (P. L. Peters)	2	146	43.13	181
Louise Grand (H. S. Plant)	2	675	68.08	286
Do. (tailings)		675	70.25	295
Mashona (B. G. Byerley)	2	76	50.59	212
Mont d'Or (Claxton & Russell)	2	114	90.22	379
Salisbury Total			560.89	2
UMTALI DISTRICT—				
Contact (D. Tulloch)	3	22	4.37	18
Elgin (Umtali Waterfall Synd.)	(10)	264	168.32	707
Do. (tailings and slimes)		175	25.69	108
Kent (E. Evans)	5	181	171.62	721
Do. (tailings)	--	330	52.08	219
King's Daughter D.B. (Umtali Waterfall Synd.)	10	201	23.17	97
Do. (tailings and slimes)	—	201	18.10	76
Liverpool 38 (R. G. Snodgrass)	5	680	66.98	281
Do. (tailings)	—	280	25.03	105
Mecca (Umtali Waterfall Synd.)	(10)	312	80.89	340
Do. (tailings and slimes)	—	312	15.66	66
Palmyra (J. de G. Birch)	3	60	6.67	28
Pilgrim (J. Meikle)	5	528	330.16	1387
Quagga (Feb.) (Quagga Synd.)	5	720	120.12	504
Do. (March)	5	700	201.32	846
Rezende Mines, Ltd.	85	8600	1943.66	6974
Do. (concentrates)	—	134	485.33	2029
Do. (tailings)	—	2012	302.59	1281
Rezende D.B. 2 (Imbeza Synd. No. 2)	10	3616	441.31	1885
Do. (Concentrates)	—	7	34.27	142
Umtali Total			4,220.37	17,817

MASHONALAND TOTAL ... 21,174.54 ozs.
VALUE ... £101,997.
GRAND TOTAL ... 61,274.36 ozs.
VALUE ... £257,797.

SUMMARY.

Silver	10,708.46	ozs.	£1,120
Lead	23.20	tons.	331
Chrome Iron	2,339.45	tons.	5,222
Wolframite	4.31	tons.	427
Diamonds	49	carats.	196
Coal	21,091	tons.	6,820

GRAND TOTAL VALUE MINERAL OUTPUT ... £271,913

COMPARISONS.

Gold Output, March, 1913	61,274.36 ozs.	£257,797
Gold Output, February, 1913	49,595.85 ,,	208,744
Increase	11,678.51 ..	49,053
Gold Output, March, 1913	61,274.36 .,	257,797
Gold Output, March, 1912	51,072.08 .,	215,102
Decrease	10,202.27 ..	42,695
Gold Output, March, 1913	61,274.26 ..	257,797
Gold Output, August, 1911	57,890.01 ..	243,712
Increase over previous best monthly return	3,384.35 ..	14,085

GRAND TOTAL OUTPUT.

Gold.—			Ozs.
Output to	December 31,	1906	1,989,775.69
Do.	do.	1907	612,052.35
Do.	do.	1908	606,961.38
Do.	do.	1909	623,388.07
Do.	do.	1910	609,955.82
Do.	do.	1911	628,521.37
Do.	do.	1912	612,807.07
Do.	do.	1913 (3 months)	163,325.28
Total to date			5,876,786.98
Value of Gold Output to date			£23,066,014

C : Chilian Mill ; T : Tube Mill : G.R. : Gates Roll ; H : Huntington Mill ; P : Grinding Pan ; Pn. : Pneumatic Mill ; D : Dolly.

Engineering Notes and News.

POWER SUPPLY ON THE RAND.—II.*

[By A. E. Hadley.]

ROSHERVILLE POWER STATION.

When the contract with the Rand Mines, Ltd., was concluded, the site for the station was selected at the Rosherville Dam, which is the largest lake on the Rand, being enclosed on the southern side by a dam. This station will shortly have a capacity of nearly 100,000 k.w. of plant installed. After the new extensions are completed the turbine room will be 450 ft. long and 75 ft. wide, and there will be five right-angle boiler bays each containing eight boilers. The station buildings are of steel construction, in which the size and weight of each member has been kept small in order to reduce the cost of transport. The coal-storage arrangements are very complete, the coal being discharged from a height of 14 ft. through the floors of 40-ton railway trucks into outside storage bunkers, under which coal conveyors are arranged. The whole structure is open, as roofing is unnecessary owing to the favourable climatic conditions. The conveyors, each capable of dealing with 40 tons of coal per hour, run in tunnels under the external coal store, and are fed with coal by gravity through shoots from the coal pile above. These conveyors are kept running practically continuously, allowing the internal coal bunkers in the boiler house to be of small capacity. An automatic tip is fitted over the bunkers, which tips the conveyor buckets when the coal in any particular bunker has fallen below a certain level. Weighing machines are installed in the conveyor tunnels, and the coal is weighed as it passes in the conveyor buckets. The ashes are discharged from the rear of the stokers into hand trucks in the basement, where natives push the loaded trucks out and attach them to a motor-operated rope haulage leading to the ash dump. The question of removing these ashes by suction is at present under consideration. The class of coal burnt at this and other Rand stations is mostly the small coal from the collieries in the Middelburg district 60 miles distant, mixed with a proportion of the duff produced by the coal-cutters. The coal has an average calorific value of about 11,000 B.Th.U.'s per lb. The large percentage of ash, viz., 18 to 25 per cent. of the coal, and the high load factor at which the plant is operated, necessitated a combination of boiler, superheater, and economizer, that would give the highest possible efficiency; and the high cost of white labour, and the inefficiency of that of the native, also required that the plant should be mechanically operated. In view of these considerations and the great cost of constructional work in South Africa, the ejector system of induced draught originally devised by Mr. Pratt has been adopted in all the power stations. The system has been found to give the utmost satisfaction. In the lay-out employed, adjacent boiler units are connected to a common ejector chimney, the top of which is 90 ft. above the boiler-house floor. An electrically-driven rotary fan capable of developing 75 h.p. blows cold air through the ejector situated in the chimney, thereby producing the necessary suction in the flues, and a draught of about 1 in. is usually employed. With this arrangement great flexibility in the boiler house is obtained, and by the use of a torpedo-shaped damper in the air pipe regulating the pressure of the air jet, the duty of the boiler unit can be easily regulated to suit fluctuations in the load. The plant is absolutely smokeless, and it is difficult by looking at the ejector chimneys from outside the station to tell which boilers are at work. The boiler unit selected is the Babcock and Wilcox marine type, fitted with chain-grate stokers, each having an integral superheater and economizer. The boilers are arranged in two rows in each boiler house, with a central and common firing floor. Each boiler has a rated capacity of 32,000 lb. of steam per hour at a pressure of 220 lb. with a temperature of feed water of 100 deg. Fahr., and is capable of producing 38,000 lb. of steam without undue forcing. The heating surface of the boiler is 5,520 sq. ft., of the superheater 1,720 ft., and of the economizer 2,200 sq. ft. A six-hour test on one of the boiler units gave a combined efficiency of boiler, superheater, and economizer, of 80 per cent. The turbine room at present contains five turbo-generators each of 12,000 k.v.a., and six steam compressors each having an input of 3,500 k.w.; three more steam compressors each taking 7,030 k.w. are also being installed. The turbines are of the A.E.G. Curtis horizontal type, having one high-pressure wheel with three rims of blades. The admission pressure at the intake nozzles is brought down from 220 lb. at a temperature of 300 deg.—350 deg. C. to about 20 lb. with a superheat of about 20 deg. C. In the low pressure portion of the turbine, the steam is expanded through 12 stages. Both hand and motor regulation of the speed are arranged for. The total weight of a 12,000-k.v.a. turbine set, including condenser and pumps, is 370 tons. The stators of each of the six-pole generators are bar wound, having one bar per slot. The machines running at 1,000 revs. per minute produce 50-cycle three-phase energy at 5,000 volts, which is stepped up to either 10,000, 20,000, or 40,000 volts, by transformers directly connected with the stator terminals. Substantial clamping is employed on the end windings of the stator so as to withstand short-circuits. The rotor coils are lined with metal casings before being attached to the rotor by dovetailed grooves and wedges. The rotor carries a ventilating fan at each end. The frequent dust storms in South Africa charge the air with heavy particles which might prove dangerous in the ventilation of the machines, consequently each machine is provided with an air filter having an effective service of fireproof cloth of 8,000 sq. ft. Each turbine set is provided with a direct-driven exciter, while a standby supply is also available from a motor-generator and battery. The condensers have a cooling surface of 17,750 sq. ft.; each set has a centrifugal circulating pump of about 663,000 gallons per hour capacity, and a centrifugal air pump, both connected on one shaft and driven direct by a steam turbine. The exhaust from the auxiliary turbine is taken to the middle stage of the main turbine, where the remaining energy in the steam is utilised down to the vacuum condenser. The water for the condensers and compressor jackets is taken from the lake through a channel excavated along the front of the station, and is discharged into a second canal placed alongside the intake; this canal re-delivers the warm water to the lake at a point as far from the intake as possible. Under normal conditions of water levels the intake water flows by gravity into the service canal, but in order to deal with periods when the water in the lake may be low, a pumping station has been erected half-way along the dam wall at the deepest part of the lake. This pumping station is fitted with vertical submerged motor-driven pumps, which take the water from the bottom of the lake and discharge it through pipes into the service canal. The boiler feed pumps are of the turbine-driven centrifugal type, and are installed in the tur-

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* Extracts from a paper read before the Institution of Electrical Engineers.

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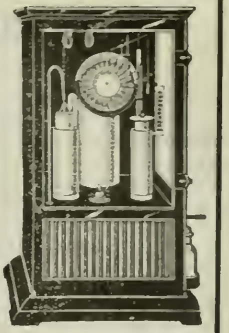

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bine room. With the exception of certain electrically-driven bearing-cooling pumps, all auxiliaries are turbine-driven. These are connected by cables to their corresponding generators, and are each of 12,500 k.v.a. capacity. Where larger transformers have been required, as for the last two sets at Vereeniging, two transformers for each machine have been installed. The transformers at Rosherville are of the shell type and water cooled, the windings nearest the terminals being specially insulated to withstand between adjacent turns a pressure of 25,000 volts for five minutes. A test pressure of 160,000 volts was applied to the whole of the windings. The weight of each transformer complete without oil is 50 tons; the oil itself weighs 21 tons. The steam turbo-compressors at Rosherville are similar to the motor-driven compressors at Robinson Central, and are each designed to deal with 22,000 cub-ft. of free air per minute with an outlet pressure of 9 atmospheres (absolute). The power required on the shaft is roughly 3,500 k.w. In the case of electrically-driven sets at Robinson Central each unit is divided into two halves on separate shafts, each motor having a capacity of about 2,000 k.v.a., and being designed to operate at full load at a leading power factor of 85 per cent. The sets run at 3,000 revs. per minute. The steam-driven compressors are arranged in two sections on the same shaft with an intercooler between them. The cooling water required for the jackets of the compressor and intercooler amounts to about 40,000 gallons per hour. The air leaves the compressor at a temperature of about 70 deg. C. Between the compressor and the pipe line an automatic non-return valve is fitted, which allows a compressor to drop out to atmosphere when its pressure falls below that of the air system. By the use of the rotary compressors the air entering the pipe system is kept entirely free from oil and other impurities liable to be introduced into the air system when piston compressors are employed. The speed regulation of the steam turbo-compressors is automatically controlled by the pressure in the air pipes. The regulation of the electrically-driven compressors at Robinson Central is affected by throttling the intake. The weight of a turbine-driven compressor, condenser, and pumps is 180 tons. The switchgear is laid out in a building at the southern end of the station, and the step-up transformers are in cubicles arranged along the outer side of the switch-house. The last-mentioned is constructed with four floors: the upper floor contains the lightning-arrester gear, the third floor the busbars, the second floor the 40,000- and 20,000-volt oil switches, whilst the lower floor is occupied with cableways and pipe-passages. Duplicate busbars are installed for both the 40,000- and 20,000-volt systems, the various oil switches being provided with knife selector switches to connect to either busbar. The 40,000- and 20,000-volt systems are connected together through coupling transformers. The switches consist of three single-phase coupled switches operated from a control board.

(To be continued.)

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Vaal River Gold Fields.

The annual report just issued by Vaal River Gold Fields, Ltd., shows that the directors have experienced many difficulties in carrying on the work of the company, the chief being the failure of an underwriting corporation to complete its obligations to take up 1,000,000 shares at the price of 9d. each. This left the board without working capital, but they were able to make a debenture issue of £6,000, and then work was commenced in real earnest. Another difficulty supervened, for the decline of reef value in the northern workings at depth disarranged the original programme. The board sent their managing director, Mr. W. N. Morrison, to the spot, in January, 1912. The first part of the scheme devised by him has been completed. The mill is finished and ready to start, and a tube mill installation is being provided, which will enable any diamonds, contained in the reef matter, to be recovered undamaged. The plant (*vide* the reports of the engineers and the company's representatives in South Africa) will have a monthly capacity of 4,500 tons. The revenue from this is estimated at £2,250, irrespective of the tailings, which are relied upon to increase it to £2,850. Working costs per ton are estimated at 10s. as a minimum and 12s. as a maximum. On this basis, crushing is expected to commence in about three months, and, then, if the mine be proved to be of the value expected, the scale of operations will be much extended. For this, the company can provide funds by the re-issue and allotment of its 1,046,512 forfeited and unissued shares, which will provide nearly £40,000.

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Finance, Commerce, and Industries.

Johannesburg Valuation.

The Valuation Court sat in the Council Chamber this week, when the objections to the proposed valuations for 1913 were considered. The provisional valuation, as drawn up, amounts to £33,603,631, represented by £17,145,882 in respect of land and £16,457,749 in respect of buildings. The valuation roll for 1913 amounted to £30,686,015, represented by £14,529,692 in respect of land and £16,156,323 in respect of buildings. The increase in the roll as drawn up amounts to nearly £3,000,000, but about one-third of this is represented by an increase in the value of municipal undertakings, the remainder, roughly, about £1,900,000, being represented by the rise in the value set down for privately held land and buildings. The objections amount to realise Russia's reluctance to be drawn into the mainly concerned with property in the centre of the town and towards Newtown, where there is a big increase in the value.

* * * *

New Railways.

We give below the estimated cost of construction and equipment and also the Railway Board's estimates of earnings and net losses on each of the new branch lines for the first year of working, provision being made for interest on capital at the rate of 3½ per cent. only:

	Costs.	Earnings.	Net Losses.
Carnarvon to Calvinia and Twee Rivers	£741,500	£23,427	£27,286
Gairtney to Outspan	60,900	1,237	3,243
Idutywa to Umtata	324,649	20,602	8,121
Delarey to Pudimore	312,700	13,219	11,437
Bethal to Volksrust	453,560	15,655	16,073
Vierfontein to Kroonstad ...	212,611	15,686	4,592
Vierfontein to Bothaville ...	82,038	2,933	3,417
Aliwal North to Zastron ...	273,000	9,841	7,471
Fauresmith to Koffyfontein ...	125,800	7,627	5,510
Gingindhlovu to Eshowe ...	117,800	5,556	2,350
Schroeders to Lot 14a	54,000	4,502	910
Dalton to One House Farm ...	56,500	3,796	1,617
Paddock to Harding	159,367	8,650	6,411
Donnybrook to Underberg ...	142,800	3,030	7,040
Totals	£3,117,225	£136,761	£105,458

* * * *

Shortage of Trucks.

In the House of Assembly last week, replying to Sir Edgar Walton (Port Elizabeth), the Minister of Railways said his attention had been drawn to the present shortage of trucks at the different centres of the Union. The Administration was fully aware of the position and its principal officers were keeping closely in touch with the different countries and doing everything in their power to give an even distribution of rolling stock, in keeping with the traffic offering. Traffic at present was particularly heavy and difficulty was being experienced in coping with the demand for rolling stock. The position had been accentuated by the fact that the Transvaal Coal Owners' Association had orders for sixty thousand tons of shipment coal to be despatched between the 2nd and 21st April, and by the large number of agricultural shows held recently. The delay in offloading shipment and bunker coal at the ports continued to prove a considerable handicap. If the trucks containing this coal were promptly released, the Administration could undoubtedly deal with a greatly increased tonnage with the existing stock. Since Union two thousand and nine trucks had been placed in traffic, with an aggregate carrying capacity of 57,967 tons; 698 of these trucks having been placed in traffic last year. There were 1,129 trucks at present on order or in course of erection, with an aggregate capacity of 34,487 tons. Approximately 795 of these trucks should be placed on traffic before the end of the present year. An additional 626 trucks, with an aggregate capacity of 15,746 tons, had been authorised and would shortly be placed on order or erected locally.

* * * *

Price's Patent Candles.

It is announced that under the new Act of Parliament, Price's Patent Candle Co., Ltd., Act, 1912, received the Royal Assent last June, and by its provisions the company is empowered, among other things, to promote and hold shares or debentures in other companies and to issue debenture stock. In accordance with the authority of the general meeting in June last, the business of Charles Price & Co. was purchased as from July 1st, 1912, and a private company under the title of Price's Company, Ltd., has been formed to carry it on. The directors are satisfied that their expectations in recommending the purchase will be realised. The directors have also carried out the transfer of the overseas branches to private companies as from October 31st last—the Capetown and Johannesburg branches, under the title of Price's (South Africa), Ltd., and the Shanghai branch under the title of Price's (China), Ltd. All the shares in the above three companies are held by the parent company. The capital required for acquiring, establishing, and equipping the additional factories has been mainly provided out of the accumulated reserves. Additional capital will be required for the further development of the company's business, and a resolution will be proposed at an extraordinary general meeting to be held at the close of the ordinary general meeting, to be held on the 28th inst., authorising the creation of £200,000 debenture stock to be issued as the directors think desirable. The business continues to progress satisfactorily, as will be seen from the following:—1909: Profit, £79,980; dividend, 35s. 1910: Profit, £84,873; dividend, 35s. 1911: Profit, £88,816; dividend, 37s. 6d. 1912: Profit, £92,863; dividend, 40s.

Cape Asbestos Co.

The report of the Cape Asbestos Company, Ltd., shows a net profit of £7,048. A dividend of 5 per cent. has been declared; £3,000 has been placed to reserve, and £3,481 carried forward.

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THE WEEK IN THE SHAREMARKET.

European Situation Still the Restraining Factor—More Hopeful Feeling.

The market continues to be depressed by the fears of European complications over Montenegro. The belief is growing, however, that the worst is over, and that the united pressure of Austria and Russia cannot fail to bring the small but defiant cause of all the trouble to its senses. The fact that Austria has consented to stay her hand till Montenegro has had more time for calm thought in which to realise Russia's reluctance to be withdrawn into the quarrel is the best feature of the situation. This war-cloud once removed, the market cannot fail quickly to respond to all the favourable influences at work. On the Rand, for instance, labour is satisfactory, the water trouble has lost its terrors, and good accounts come from nearly all the mines. Tin and diamond stocks are, however, still in most favour with the small investor. In the event of a good market these counters would undoubtedly lead the van of activity, and in view of that contingency they are being quietly pick up. Zaaiplaats, Rooibergs and Swazis are, of course, the favourite tin counters, and all three are in favour again. Among diamonds, Frank Smiths, Crowns and Nationals are being bought and provide very interesting speculative possibilities. In the opinion of most competent observers it only requires some further confirmation from Europe of the more favourable reading of the latest Near Eastern developments to ensure a general advance in prices.

* * * *

	Friday, 25th.	Sat., 26th.	Mon., 28th.	Tues., 29th.	Wed., 30th.
African Farms	16 6B	16 6B	16 6	16 6B	16 3B
Apex Mines	27 3	27 0B	27 0	—	26 0
Aurora West Uniteds	10 0	—	—	—	—
Bantjes Consolidated	21 6B	—	21 0B	20 9B	20 0B
Benoni Consolidated	3 0B	3 3B	3 0B	3 2B	3 0B
Blaauwbosch Diamonds	110 0	107 6B	—	105 0B	100 0B
Brakpan Mines	83 0B	81 0B	80 0	79 0	79 0
Breyten Collieries	31 0B	32 0s	—	—	31 0B
Bushveld Tins	—	—	0 10s	—	—
City & Subs. (£4)	49 9s	49 0B	49 6B	49 0B	49 0B
City Deeps	70 0	69 9B	70 3	69 6B	69 6B
Cloverfield Mines	6 3B	6 4	6 3B	6 2B	6 0B
Concrete Constr.	—	4 0B	4 0B	4 0B	4 0B
Cons. Investment	—	22 0B	—	—	—
Cons. Langlaagtes	27 9	28 0B	27 6B	—	27 6B
Cons. Main Reefs	20 3B	20 6	20 6	20 3	20 3B
Cons. Mine Select.	12 6B	—	—	13 3s	12 6B
Coronation Freeholds	0 5B	—	—	0 5B	0 5B
Coronation Syndicate	—	—	—	3 6B	3 6B
Crown Diamonds	8 0B	8 3B	8 0B	8 0B	8 6
Crown Mines	150 0B	150 0B	—	—	—
East Rand Centrals	9 6B	9 6B	9 6B	9 6	9 3B
East Rand Coals (2/6)	1 9B	1 6B	1 8	1 9	1 8B
East Rand Deeps	—	2 8B	2 6	2 4B	2 4B
East Rand Props.	—	—	—	—	55 6B
East Rand Debs.	—	—	£93½B	£92½B	£95s
Eastern Golds	2 0s	1 8	—	—	1 9
Frank Smith Diamonds	11 9	11 9B	11 6B	11 9	11 6
Geduld Props.	24 0B	24 3B	24 6	23 9B	23 6
Geldenhuis Deeps	—	34 6B	—	—	—
General Minings	—	17 0B	—	17 0B	16 0B
Glencoe (Natal) Colls.	7 0B	7 0B	7 0B	7 0B	—
Glynn's Lydenburg	—	17 6B	—	—	—
Government Areas	22 0B	22 3B	22 0B	21 9	21 6
Hex River Expls.	0 6B	0 6B	0 6B	0 6B	0 6B
Jumpers	—	—	5 0s	5 0	4 0B
Jupiters	10 6B	10 6B	10 0B	—	10 9B
Kaalfontein D. (2/6)	—	0 5s	0 5s	0 5s	0 5s
Klerksdorp Props.	2 6B	2 6B	2 6	—	2 4B
Knight Central	12 9B	12 9	12 6	12 6B	12 3B
Lace Props.	3 8B	3 8B	3 8B	3 9s	3 6B
Luipaardsvlei Estate	—	8 9B	—	—	—
Lydenburg Gold Farms	2 8B	2 6B	2 7B	2 8B	2 7B
Main Reef Wests	14 3	15 0B	14 6	14 0	13 3B
Main Reef West Debs.	£92B	£90B	£88	—	—
Meyer & Charltons	—	—	—	108B 9	108 9B
Middlevlei Estates	—	1 0B	—	—	—
Modder B's	80 0	80 0	79 0B	79 0B	78 6B
Modder Deeps	38 3s	38 0	37 0B	36 6B	36 6
Natal Navigation Coll.	16 0s	—	16 0s	15 6s	—
New Era Cons. (5/-)	7 9B	7 9B	7 9B	7 9B	7 6B
New Geduld Deeps	2 6s	2 6s	2 6s	2 0B	2 0B
New Kleinfonteins	22 6B	22 0B	22 6B	22 6B	22 6B

B Buyers. S Sellers.

	Friday, 25th.	Sat., 26th.	Mon., 28th.	Tues., 29th.	Wed., 30th.
New Rietfonteins	6 0	6 3s	6 0s	6 0	—
New Unifieds	12 6B	—	—	14 6B	15 3s
Nigels	—	—	16 0B	16 6B	16 6B
O.F.S. & Trans. Diam.	1 9	1 9B	1 9B	1 10s	1 10s
Pickstone Golds	40 0B	41 0B	42 6B	42 6	40 0B
Premiers Def. (2/6)	230 0B	—	—	—	—
Premier Pref. (5/-)	180 0B	180 0B	—	—	—
Pretoria Cement Co.	55 0B	55 0	—	—	—
Rand Collieries	6 0B	6 0B	6 0B	7 0B	7 0B
Rand Klips	1 9B	1 9B	1 10	1 10	1 9B
Rand Nucleus	2 8	2 8B	2 7B	2 6	2 6
Randfontein Deeps	6 0s	—	—	5 0B	—
Randfontein Estates	29 6	29 6B	29 3B	28 6B	28 6B
Roberts Victors	—	—	—	27 6B	—
Robinson Deeps	41 6	41 9B	41 6B	41 0B	40 0B
Rooiberg Minerals	35 6	36 0B	36 0	36 0B	36 0B
Roodepoort Durbans	20 0B	—	—	—	—
Roodepoort Durban Deeps	—	24 0B	23 9B	—	23 0B
Ryan Nigels	—	—	—	—	3 3B
Shebas	—	5 3s	5 0B	—	5 0B
Simmer Deeps	3 6s	—	3 6s	3 6s	2 10B
Solomon's Temple Tin	—	—	—	0 6	—
S.A. Breweries	40 0B	—	40 0B	40 0B	—
S.A. Lands	4 0B	4 3B	4 2B	4 2B	4 0B
Springs Mines	16 0B	—	14 9B*	15 3B	15 9
Sub Nigels	12 9s	12 6	12 3B	—	12 0B
Swaziland Tins	43 0	42 0B	44 0	—	—
Trans. Coal Trusts	49 0	48 6B	48 0*	46 6B	46 6B
Trans. G.M. Estates	52 3B	53 6B	53 0B	53 0B	53 0B
Tudors	2 0s	—	—	—	—
Van Ryn Deeps	29 0	29 6	29 3	29 0	28 6B
Village Deeps	—	46 0B	43 0B	44 0s	43 0B
Village Main Reefs	—	—	—	42 6B	—
Vogel. Cons. Deeps	—	—	2 0B	—	1 9B
West Rand Cons.	—	—	—	1 9B	—
West Rand Estates	4 0B	—	—	—	3 9B
Witbank Collieries	47 0B	47 0B	47 0B	47 0B	47 3B
Witwatersrands	69 0B	—	70 0B	—	72 0s
Wit Deeps	55 6B	58 0	58 0	58 0	56 6
Wit Townships	26 0B	—	—	26 0B	26 0B
Wolhuters	17 6	17 3	17 0B	17 0B	17 0B
Zaaiplaats Tins	37 3B	37 6	37 3	37 9	37 9

* Ex Rights. B Buyers. S Sellers.

Manicaland Gold Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of March is as follows:—Reef: Mill: Gold won (fine gold), 235 ozs. 15 dwts. 4 grs.; tons crushed, 1,639; value, £990 1s. 7d. Concentrates (estimated): Gold (fine gold), 23 ozs. 14 dwts.; tons, 6; value, £100 4s.; silver and lead value, £65 8s. Cyanide: Gold recovered (fine gold), 7 ozs. 7 dwts.; tons treated, 114; value, £30 17s. 4d.

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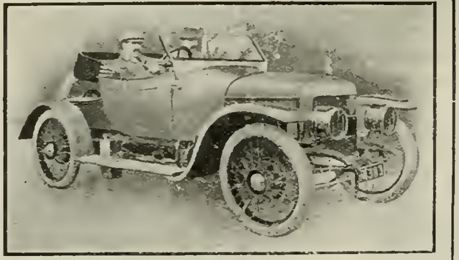

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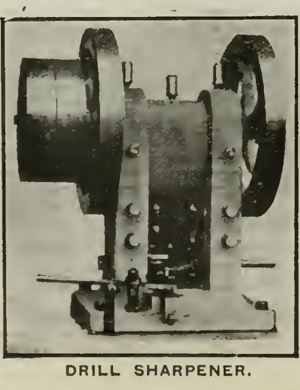

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Automobile Notes.

The Cape Motor Bill is being criticised in motoring circles with doubt as to some of its clauses, qualified satisfaction as regards others, and condemnation in regard to some. The taxation figures are held to be too severe, in view of the fact that the motor movement already pays so heavily through the Customs. According to Mr. A. T. Hennesey, who spoke on the subject at the annual banquet of the Royal Automobile Club of South Africa, at the Mount Nelson Hotel last Friday evening, the amount contributed in import duties totalled over £100,000. This, of course, goes into general revenue. The only feature of the additional taxation proposals regarded with favour is the earmarking of the proceeds for the betterment of the roads of the country. It is felt by motorists that in this way, at any rate, they may get back some of their own in the added comfort of traveliing, for instance, over subway drains or culverts, instead of thumping through the appalling open cross drains which disgrace the highways outside the Cape Peninsula.

* * * *

Satisfaction is expressed that it is not proposed to leave the motorist, charged with a technical offence, to the tender mercies of the type of magistrate instanced by Sir Frederic de Waal in his speech at the banquet referred to above. Much doubt obtained with regard to the clause which provides that the evidence of one witness, in cases where speed limits are exceeded, is sufficient. Indignation is expressed at the clause which differentiates against the motorist in favour of all other classes of road users. Wherever a motorist is in any way connected with an accident, whether as the cause or the victim, he must, on demand, furnish his name and address. He himself has no right to demand similar information from other parties to the accident. Surely some omission has occurred here in drafting the Bill?

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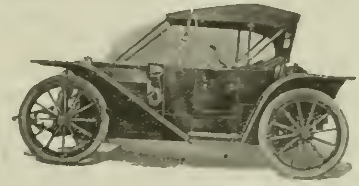

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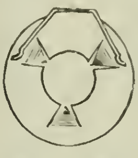

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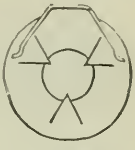

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IN THE HIGH COURT OF JUSTICE.
COMPANIES (WINDING UP.)

IN THE MATTER OF THE COMPANIES CONSOLIDATION ACT, 1908,

AND

IN THE MATTER OF THE LANGLAAGTE PROPRIETARY COMPANY, LIMITED.

NOTICE IS HEREBY GIVEN that all persons claiming to be Shareholders of the above-named Company, or being the holders of Share Warrants issued by the said Company, are to send in their names, addresses and descriptions, together with the number or numbers of share warrant or share warrants and the number or numbers of share certificate or share certificates in the case of registered stock and in each case the distinctive numbers of the shares included in such share warrants or certificates so held by them to GEORGE JAMES VINCENT EMSELL, of 120 Bishopsgate, in the City of London, the Liquidator of the above-named Company, on or before the 31st day of July, 1913, and if so required, by notice in writing from the said Liquidator, are by their Solicitors or personally to come in and prove their claims at such time and place as shall be specified in such notice, or in default thereof they will be excluded from the benefit of any distribution to be made.

Dated this Eighteenth day of April, 1913.

WEBBER & WENTZEL,
City House, Harrison Street, Johannesburg,
Solicitors for the above-named Liquidator.

Klerksdorp Proprietary,

The adjourned meeting of the Klerksdorp Proprietary Mines was held last week to hear the result of the poll taken on the proposal of Mr. J. H. Ryan that the number of directors should remain at eight, this being an amendment to a motion of Mr. Hudson that the number should be reduced to six, three to be local and three to be resident in London. Mr. Symons declared that the poll showed that Mr. Ryan's amendment that the number of directors remain at eight had been carried, there being 71,183 votes for and 800 against. The election of the local board was then proceeded with, and the following were chosen: Messrs. J. O. Reid, J. E. Jones, Fritz Elkan, J. H. L. Manisty and W. P. Fisher. The following were then proposed for the London board, three being required: Messrs. A. Hyman, E. J. Sloan, E. L. Brown, B. M. Ries, A. Moses and F. Bruch. Another poll was demanded, the result of which will be announced later.

Rhodesian Native Labour.

The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of January and February, 1913:—

	January.		February.
Local	10,011	......	10,386
Portuguese territory	5,978	......	5,769
North-Western Rhodesia ...	2,944	......	3,096
North-Eastern Rhodesia ...	5,916	......	5,791
Nyasaland	5,748	......	5,794
Other sources	824	......	872
	31,421	......	31,708

The number of natives employed in February shows a decrease of 2,529 when compared with the corresponding period of 1912.

The distribution during the months of December, 1912, and January, 1913, was as follows:—

	December, 1912.		January, 1913.
Producing gold mines ...	20,655	......	20,317
Non-producing gold mines..	8,902	......	9,929
Coal and other mines ...	1,177	......	1,175
	30,734	......	31,421

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INVESTORS' DIARY.

The following company meetings have been announced:—

May 10.—Roberts Victor.
May 16.—Wit. Deep; Marievale Nigel; Vogel Deep.
May 21.—Apex Mines; New Kleinfontein.
May 23.—Knight Central; Cloverfield Mines.
May 27.—Transvaal Coal Trust; Brakpan Mines; Springs Mines; New Era Consolidated.
May 29.—Roodepoort United; West Rand Consolidated; Meyer and Charlton; New Goch.
May 30.—Sacke Estates; Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries.
June 3.—Moderfontein B.; Robinson.
June 4.—Rose Deep; Village Deep.
June 5.—Durban Roodepoort Deep; City Deep.
June 6.—Bantjes Consolidated; Geldenhuis Deep; Crown Mines.
June 17.—Transvaal Consolidated Lands.
June 18.—Rand Mines.
June 27.—A. Goerz and Co.

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South African Mines, Commerce and Industries.
ESTABLISHED 1891.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Tropical Native Recruiting.

When Sir Almroth Wright, at the invitation of the Chamber of Mines, undertook his investigations into the cause of the high rate of mortality among natives recruited from East Coast tropical areas last year, it was hoped that some good results might accrue. These results have, however, been delayed, and despite the fact that last month the mortality rate among this class of "boys" was considerably reduced, Mr. Sauer announced in the House of Assembly on Thursday that recruiting in those areas must stop—temporarily, it may be hoped. The step means a loss to the Rand of something over 20,000 unskilled native labourers. It may be urged that these tropical "boys" were never a very efficient force; that on them the mines lavished an inordinate amount of care, and that they were the most costly portion of the labour supply. The loss, however, is a serious one, and the only good feature is the fact that should Sir Almroth Wright's coming report prove satisfactory, recruiting from the proscribed area may again be permitted. Meanwhile it may be hoped that the irresponsible section of the Press will refrain from senseless exaggerations of what everyone has all along admitted was a pressing and serious question.

* * * *

Latest from the Modder Deep.

Development work at the Modder Deep Levels continues to expose ore of satisfactory width and value, and the latest news from the property is wholly encouraging. Rumours as to difficulties with regard to water have been greatly exaggerated. The management is dealing at present with a quarter of a million gallons per day without any trouble whatsoever. We learn that the May Consolidated Company recently purchased 15,000 shares in this concern. The advisability of investing some of the funds of the old outcrop company in attractive investments was referred to by the chairman at the last meeting, and shareholders are to be congratulated on the purchase.

* * * *

Geduld.

Some little delay is likely to take place in the starting up of the new plant at this property. The postponement of enlarged milling operations is, however, likely to be of short duration. It was hoped that the new stamps would be dropped in the first week of June, and at the most the delay will only be of three weeks, so that the new plant will be in operation before the end of next month. Elsewhere in this issue we deal with the results secured at this mine last year.

* * * *

The Lonrho Co. and East Gwanda.

It is reported from Bulawayo that a syndicate represented by the London and Rhodesian Mining and Land Company has acquired the whole of the assets of the East Gwanda Mines, Ltd. The propositions included in the purchase are the Geelong, Jessie, West Nicholson, Eagle Vulture and Olympus mines. Under the ægis of the East Gwanda Mines, Ltd., these propositions did not earn profits, and some time ago the company went into liquidation. Whether under other control these Gwanda properties will secure dividends or not we cannot say, but admittedly the past record is far from encouraging.

* * * *

Tin and Copper Mining in South Africa.

The tin mining industry of the Transvaal is, if statistics may be regarded as affording a criterion of prosperity and activity, again on the ascendant. The sales and shipments for March were 319 tons, containing 68·96 per cent. of metal and of a total value of £44,530, which compares most satisfactorily with 254 tons, worth £32,817, in February, and 255 tons, or £34,517, in January. The value of shipments for the first three months of the current year, it is interesting to observe, was £111,864, as against £367,699 for the whole of 1912. Tin mining in the Cape Colony is still apparently dormant, there being no announcement of production. In regard to copper, too, the Transvaal shows an increase, there being shipped 400 tons of a metal value of 46·36 per cent., or £11,433, as compared with 357 tons, value £10,307, in February. On the other hand, the Cape records a lesser shipment—963 tons, as against 2,085 tons. It should, however, be realised that sales and shipments do not reflect the production. The actual output from the Namaqualand mines for the month was 1,367 tons containing 46·27 per cent. of metal.

* * * *

Our Sharemarket List.

In response to requests from many quarters, and letters from all parts of South Africa and oversea, it has been decided to continue, as a permanent feature of this paper, the weekly list of sharemarket quotations. The page will appear regularly in future with the usual brief resumé of the tone and tendency of the market. It has been suggested that we should open our columns to advertisements of shares for sale and wanted; and it would be interesting to have the views of our readers regarding such a method of saving brokers' charges and facilitating the sale and exchange of shares for a nominal fee through the medium of our advertising columns.

* * * *

Our London Office.

From the 15th inst. the London address of this paper will be at the office of the Argus P. and P. Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C. Enquiries relative to advertisements and subscriptions should be addressed to that office, and specimen copies of the paper are always available there.

* * * *

Swazi Tin.

Recent reports from the Swaziland Tin property are very favourable, and substantial profits are now being earned by the aid of the new plant. It will be remembered that the "T.C.L." and De Beers some time ago took an interest in the property, and Mr. J. J. Garrard was appointed consulting engineer. Since then good progress has been made, and the profits have improved. In the recent annual report of the "T.C.L." readers who are interested will find valuable information regarding the property.

* * * *

"M. F." Reconstruction.

It is understood that the M.F. (Rhodesia) Proprietary, Ltd., has sold its assets and undertaking to a new company registered in England under the title of the "M.F. Exploration Company, Limited," and that shareholders will receive two shares in the new company for each share held in the old company. At a general meeting of the company, held on 8th April, an extraordinary resolution was passed placing the company in voluntary liquidation and appointing Messrs. William Philips Fisher and Leo Mayer as liquidators.

* * * *

Congo Diamonds.

Although it is difficult, if not impossible, to judge at this distance of the diamond-bearing possibilities of certain remote districts of the Congo Free State, it seems certain that gem stones have been found over widely distributed areas of that territory. So important indeed has the diamond mining aspect of mineral industry in the Congo become that new laws to regulate the sale and mining of diamonds have been passed in Brussels. The other day the Belgian Colonial Council discussed a Bill abolishing the diamond mining reserve at the Kundelungu Diamond Mine and the reserve at the Mandoko Mine and regulating the sale and mining of diamonds on the lines of the regulations in German South-West Africa. The Minister of the Colonies said he would withdraw the clause creating a monopoly in the sale of diamonds and other precious stones. The clause relating to mining was approved.

* * * *

Van Ryn Deep.

Excellent progress continues to be made at the Van Ryn Deep, and the reduction plant is in a forward state. The sound ore reserve position is a good feature that gives confidence in the future of the mine.

Pilandsberg Diamond Flotation.

It is understood that the latest diamond prospect, discovered a few weeks ago in the Rustenburg district, was successfully floated as a private venture this week. Mr. J. Dale Lace is the chairman of the concern, and he will have nothing but good wishes for the success of the venture.

* * * *

S.A. Diamond Corporation.

The S.A. Diamond Corporation, Ltd., was registered during the week by Messrs. Lewis & Marks, to take over and extend the business of their diamond branch. The new corporation has an authorized capital of £1,000,000, and of this £100,000 has been paid up. The many diamond interests of the firm of Lewis & Marks will be taken over by the new concern, and its object will be to provide the capital necessary for their development. It will be remembered that the firm holds a controlling interest in Crown Diamonds and Roberts Victor, in addition to large holdings, actual and optional, in the Blaauwbosch, New Thor, National and Montrose mines. With such powerful backing, all these propositions should now have justice done to them. Of course the main factor in moving the firm to this fresh enterprise is the enhanced price of diamonds and the possibility of working at reduced cost. In view of these conditions, better returns are now expected from the Crown Diamond Mine and the various other ventures in which the new diamond corporation is concerned. The directors, or proposed directors, of the new company are: Messrs. Isaac Lewis, Lewis and Marks' Buildings, Johannesburg; Bernhard Oppenheimer, 20, Holborn, London; George Hesse, Stock Exchange Buildings, Johannesburg; Heinrich Daniel, Stock Exchange Buildings, Johannesburg; and Gilbert Roy Lewis, "The Outspan," Parktown, Johannesburg. The first subscribers to the articles of association, who take one share each, are Messrs. Isaac Lewis, George Hesse, S. Marks, H. Daniel, G. Roy Lewis, J. D. Massey, and D. F. Gilfillan. Messrs. Isaac Lewis and Bernhard Oppenheimer are entitled to subscribe for two permanent directors' shares of £1,000, to which certain privileges are attached, and they are further interested in so far that, as shareholders in Messrs. Lewis and Marks' Diamond Branch, Ltd., they have procured an option over shares of the company and the sole right to purchase diamonds for a period of 10 years on behalf of Lewis and Marks' Diamond Branch.

* * * *

Springs Prospects.

Latest accounts of development at the Springs Mines are favourable, and the property seems to be opening up well. At the annual meeting of the Consolidated Mines Selection Company in London in mail week, both the Chairman and Mr. B. Kitzinger spoke hopefully of the outlook for the mine.

* * * *

Rooiberg.

The excellent Rooiberg returns for April appear elsewhere in this issue. Including this month's profits, the cash in hand is understood to amount to about £48,000. With the profits likely to be earned in both May and June, the cash in hand should easily suffice to pay 4s., or 20 per cent., for the half year.

* * * *

Rand Mines' Finances.

The report of the Rand Mines, Ltd., for last year shows that a profit of £1,138,382 was made, or £20,973 over that for 1911. This is accounted for by an increase in profits on investments sold of £42,493 and a net decrease in other profits of £21,520. It was impossible last year to sell many shares, and Rand Mines, Ltd., got rid of 5,400 Modder B, 47,500 Government Gold Mining Areas, 22,500 Wolhuters and 3,933 Ferreira Deeps. Rand Mines, Ltd., bought 1,000 New Modders, 14,000 City Deeps and 1,400 Durban Deeps, all of which are under the management of the Corner House. From a perusal of the report and balance sheet it will be gathered that the company, whether it is able to sell shares or not, will earn sufficient revenue from its investments to pay 220 per cent. The companies in which the largest stakes are held are the best operating on the Rand, and there is not a failure among them. At the end of December the cash and cash assets in hand, after deducting all liabilities, amounted to £524,267, and this does not include £660,619 invested in debentures of mining companies and South African Government stocks.

* * * *

Natal Coal.

The return issued by the Union Mines Department in connection with the Natal coal industry during the month of March shows an increase of 8,170 tons, as compared with the corresponding month of the previous year, the figures being 243,600 and 235,430 tons respectively. Twenty-three collieries contributed to this result, the Natal Navigation Company heading the list with 28,788 tons, the lowest output being 11 tons from Vaalbank, which amount includes its February output. Coal bunkered at Durban during March amounted to 107,697 tons, and coal exported consisted of 54,332 tons sent oversea and 21,419 tons to Union ports. The labour employed was represented by a total of 12,580 persons, of whom 539 were Europeans, 4,059 Asiatics, and 7,982 natives and other coloureds. These figures show an increase of 1,301 persons, chiefly natives, as compared with March, 1912.

* * * *

The Rand's New Ore Reducing Plants.

Although only one brand new mill is due to commence working operations on the Rand this year—we refer, of course, to the Van Ryn Deep's equipment—the number of stamps and tube mills erected and in use will be substantially augmented before the close of 1912 by the starting up of additional stamps and tube mills at the Witwatersrand, the Brakpan Mines, the Geduld Proprietary and the Knights Deep. At a later date the increase in crushing capacities proposed for the joint Jupiter-Simmer Deep plant will be manifested. Still later new mills will be constructed on the Further East Rand to swell the already enormous aggregate of ore-reducing machines on the Main Reef series. Disregarding for the time the new mills concerning which official and definite announcements have not yet been made public, it will be of interest to observe the nature of the increases to crushing plants already sanctioned. In the following table we present the salient facts connected with such new plant as is expected to come into operation in the immediate or near future:—

Mines.	New Stamps.	New Tube Mills.	Remarks.
Brakpan Mines	40	2	New stamps will in first instance be employed as alternative to tube milling.
Geduld Prop. ..	10	4	Will bring capacity of Reduction Works up to 24,000 tons per month. Should be at work in a week or two from date.
Jupiter ..	Further Tube mills or reorganisation of plant.		Capacity of Crushing and Treatment Plants to be increased to 60,000 tons per month. Working costs to be reduced to a figure which will enable 4.1 dwts. ore to be treated.
Knights Deep	New tube mills and extension Cyanide Plant.		Due to be starting up now.
Van Ryn Deep	80	8	40,000 tons per month due to commence operations in a month or two from date.
Simmer Deep ..	New tube mills or reorganisation of plant.		Question of increasing capacity to 75,000 tons per month being considered.
Witwatersrand	—	5	Work taken in hand some little while ago. Extra tube mills will reduce value of residues and increase tonnage milled.

TOPICS OF THE WEEK.

CONDITIONS ON THE MINES.

WHETHER one takes the favourable view of the majority of the papers regarding Mr. R. W. Schumacher's speech of last Saturday night, or, with the *Rand Daily Mail*, professes to see in it nothing but the capitalist wolf masquerading in sheep's clothing, the significance of the statements made cannot be denied. For Mr. Schumacher's speech shows how unfounded are the charges repeatedly made in irresponsible quarters in regard to the attitude of Rand directors towards the men. To our mind Mr. Schumacher's views are those of the ideal employer—practical, sympathetic and full of understanding. The occasion of his remarks was a debate at the Unionist Party Club on the vexed question of insecurity of tenure of employment on the mines; but he availed himself of the opportunity to deal broadly with the conditions under which the men live and work on the mines. The "house" which Mr. Schumacher represents possesses too long and notable a record of work done to ameliorate living conditions on their mines to justify any of the jibes and sneers with which his remarks have been received in some quarters. People whose business is to exploit and widen the differences between Labour and Capital apparently cannot understand how any employer of labour can bother himself about improving the lot of the worker. If you have been busy all the week painting the employer as an ogre wallowing in the lifeblood of uncomplaining victims of his rapacity, it is doubtless difficult to recognise or realise that an employer can speak in regard to his men with sincerity, sympathy or even common sense. Mr. Schumacher's speech of last Saturday night was marked by all those qualities, and was, in addition, courageous. It takes a brave man to get up and tell any community of its shortcomings, and, though no one can quarrel with the correctness of Mr. Schumacher's diagnosis of our failings on the Rand, his views are not likely for that reason to be any more palatable. Gambling, drink and the improvidence which these things connote have, of course, been the curse of the Rand as they have been the curse of every mining community since the world began. Anything that can mitigate these evils and can encourage thrift and temperance among the men is, of course, to be welcomed by all right-thinking people; and the efforts of Mr. Schumacher and his co-directors to that end should have nothing but cordial support from the real friends of the workman. We believe that the directors of the leading groups on the Rand are genuinely anxious to make the lot of their men happier, healthier and more contented. For this reason and none other are they spending enormous sums on schemes that are directly unreproductive, such as ventilation shafts, as that at the Crown Mines; on garden villages for the men, as at Benoni, Geldenhuis and the City Deep, and the thousand and one other recent improvements above and below ground that are familiar to every worker on the mines. The drastic action taken by the Corner House directors in regard to future cases of dismissal on the mines is an earnest of their desire to stamp out all possible causes of discontent. In another direction, too, there is evidence of the care and thought that has recently been devoted to the interests of the men. Mr. Schumacher adumbrated a scheme for encouraging thrift by offering higher rates of interest on workmen's savings than those which the big commercial institutions offer. The ordinary rates really offer little inducement to the worker to husband his small savings, and Mr. Schumacher's suggestion seems to us of great practical value. In regard to the natives on the mines, we gather that Mr. Schumacher expects some far-reaching and important recommendations from the coming report of the Black Peril Commission. If his anticipations be correct, the views long held by many thoughtful observers will have a strong endorsement and some measure of stricter segregation making for the diminution of native vice and crime may be introduced. It will be seen from the variety of important topics covered by Mr. Schumacher, that his address was no ordinary one. It was a sincere and stimulating attempt to tackle some of the manifold social problems of the industry from a quarter to which the men are persistently being misinformed by interested parties that they need look for nothing but cynical disregard for their interests.

A FINANCIAL REVIEW.

Since it acquired the Bank of Africa and the National Bank of the O.F.S., the National Bank of South Africa has greatly extended its operations, and these are to-day coterminous with every branch of business and industrial activity within the Union. The annual address from the chair, delivered last week by Mr. D. Crawford, was therefore in the best sense a review of national economic progress, and in scope and method was worthy of the best traditions of London bank chairmen. Mr. Crawford did not deal at any great length with the affairs of the bank itself. He contented himself with dwelling on the increased stability afforded by the larger capital and resources at its command in consequence of the merger completed during the year. In common with chairmen of English banks, he had to announce a further shrinkage in the value of gilt-edged securities, necessitating a writing down of their value in the books. In other directions the figures for the banking year all show healthy tendencies, and the net result was described by the Chairman as satisfactory, with an outlook equally satisfactory for the year to come. Mr. Crawford's brief review of the condition of business and industry in the past year, as befitted the occasion, was cautious and non-committal. If there is an absence of enthusiasm in his contemplation of the progress made during the year, his speech breathes a confident belief in the future of the several activities reviewed. He shows what has been done to advance agriculture in all its divisions; he marks the steady forward march of mining, and he is satisfied that business generally will improve. The keynote of his whole review of the situation indeed is that we are advancing—though slowly. For a young country of illimitable possibilities the rate of advance seems to most of us absurd and inadequate. But we cannot expect bank chairmen to share this natural impatience. It is doubtless sufficient for them that there is a steady appreciation in the value of real estate, that production is quietly expanding, and that they are spared the anxiety commonly attaching to the " booming " of young countries. Whether the amalgamation of some of our big banks is to accentuate this tendency to advance but slowly remains to be seen. The National Bank people, it is to be hoped, are progressive enough to resist it. The policy of our banks hitherto has, however, been criticised as over-cautious. They have erred always on the side of safety; and, without entering upon a consideration of the vexed question of what constitutes a proper margin of safety, it may be pointed out that banks owe duties and responsibilities to the country not lightly to be disregarded. It is their function and privilege to guide and direct the surplus funds of the people into the safest and most fertile avenues of enterprise. Not only can the surplus funds of the people in South Africa be thus best utilised by the beneficent principle of banking, but—and this is a direction in which we should like to see our banks increase their efforts—a growing volume of deposits from oversea might be attracted to the development of South Africa by the offer of the more attractive rates of interest which a young country can so easily and so cheerfully afford. But the National Bank may be regarded as still in the transition stage. Its greatly increased scope and size no doubt still hamper its movements. When the big amalgamation has had time to settle down and " find itself," no doubt it will play a much greater part in the development of industry and be in a position to adopt a more liberal attitude towards every legitimate form of enterprise. The future of the institution is so bound up with the future of South Africa that one might easily rhapsodise regarding its profit-earning and business-fostering possibilities. It is enough, however, to congratulate all concerned upon the excellent results won in face of a time of some difficulty and upon the even better prospects of the present year.

THE CENTRAL MINING STANDPOINT.

The Central Mining and Investment Corporation is a factor of yearly growing importance on the Rand, and the speech of the Chairman, Mr. Friedrich Eckstein, though it contains, as far as one can judge from the cables, little that is new, cannot pass without comment. From the brief cabled summary of the speech, we gather that Mr. Eckstein stated that the mining industry during the year showed good all-round progress. He said that the increase in tonnage crushed was due to new producing mines, larger crushing capacity of older mines, and improvement in the labour position, while the introduction of small machines and other mechanical appliances resulted in increased efficiency and ability to transport ore with less labour underground. He attributed the increase in working costs to expenditure on reorganisation and ventilation, improvement in labour, and additional outlay in consequence of new legislation. Now that much of the work was completed, he said they might look forward to further increases in ore produced and profit earned. Mr. Eckstein considered that the power stations on the whole had been a success. The possibility of the Crown Mines absorbing the Robinson was also discussed, and it seems that the idea has found favour in influential quarters. Mr. Eckstein would have been wanting in his duty if he had omitted to warn the Union Government in regard to the effect produced on the mind of the oversea investor by its action or inaction regarding the water and bewaarplaatsen questions. Coming from so influential and impartial, not to say friendly, a quarter, it is to be hoped this warning will be taken seriously to heart. With Mr. Eckstein's notable speech we hope to deal further when the full text is available.

NEW SHAFT FOR THE CROWN MINES.

An 18ft. Circular Pit to be Sunk—Efficient Ventilation of Western Section the Object—Reef Expected at 2,000ft.

It has been decided to sink a new round vertical shaft on the extreme western section of the Crown Mines, with the object of improving ventilation in that area of the property. The matter was referred to by Mr. R. W. Schumacher at the Unionist Party Club last Saturday night, and we are now able to state that the shaft will be of circular type, 18 feet in diameter, that it is expected to cut the Reef at a vertical depth of approximately 2,000 feet from surface, and that it will connect with the 13th or main haulage level which is being driven right through the property from east to west.

To Cut the Reef Next Year.

It is intended to commence sinking operations in about two months' time, and as it is expected the work will proceed at the rate of about 150 feet per month the reef should be intersected thirteen to fourteen months after the commencement of sinking operations, that is to say, shortly after the middle of next year. No doubt the management of the company has been largely influenced in its decision to sink a round shaft by the excellent sinking results obtained in the circular pit of the New Modderfontein G.M. Co. This latter work was described at length in our issue of April 5th last, and as the new Crown Mines shaft will be of the same diameter as the New Modderfontein pit and is expected to cut the reef at a corresponding depth it will be of interest to refer to the New Modderfontein Company's experience. There sinking was started on January 2nd, 1911, the reef was cut on October 29th, 1912, and shaft sinking was stopped November 16th, 1912, the shaft then being 2,258 feet deep. Sinking and walling therefore took place over 22½ months, or at an average monthly speed of almost exactly 100 feet—walling and sinking being done alternately. The cost of sinking averaged £11 9s. 5d. per foot, and of bricking £7 12s. 2d. per foot, or a total of £22 1s. 7d. per foot. The total cost of the surface equipment, exclusive of quarters, amounted to £30,077. We understand that at the Crown Mines a higher rate of sinking than was attained at the New Modder is anticipated, and this should conduce towards further economy in sinking. In any case, the sinking costs of the New Modderfontein Company are highly satisfactory and the general results secured induced us to predict that such other new shafts as were called for on the Witwatersrand—some of them, at any rate—would be of circular rather than of rectangular shape. The Crown Mines Company is about to fulfil this prediction, and the results attained—the costs of sinking and the speed—will without doubt be watched with the greatest interest.

Ventilation the Object.

It may be emphasized that the sole reason for sinking this pit is to render the working conditions in the western corner of the property healthy and pleasant. Not that much fault can be found with the existing ventilation conditions of the Crown Mines, but as this western section is practically unexploited at present and as it is more or less isolated from the main workings of the mine it has been felt that in order to ensure satisfactory hygiene in the western ends a further shaft should be sunk. The new vertical will not be used for hoisting ore, the existing main shafts being capable of dealing with all rock from the various portions of the mine. Reference to a plan depicting the latest development position shows that the 13th or main haulage level is advancing towards the western boundary, and when connection between this level and the new circular pit is effected the ventilation and air conditions should leave little to be desired in any part of the immense proposition.

CITY DEEP ACHIEVEMENTS AND PROSPECTS.

Good Outlook for Improved Profit—Ability to Increase Tonnage and Lower Costs.

For the first four months of the current year the City Deep Company has crushed 174,200 tons of ore for a revenue of £325,124, and has earned a profit of £114,610. Assuming that these results are maintained for the remainder of the year, the company will, for 1913, secure a production of just under a million sterling, and will earn a profit equivalent to almost 30 per cent. on the capital of the company—£1,250,000. As a matter of fact, it is more likely that these results will be improved on than that there will be any decline in either the tonnage crushed, the gross revenue or the monthly profit. The reduction equipment consists of 200 stamps, plus tube mills, and has a total capacity of 800,000 tons per annum. The present rate of stamping is about 530,000 tons per year, so that the mill is still working very much below its capacity. The labour position has improved materially of recent months, and it is quite on the cards that the management will be able to put through a substantially larger quantity of ore and raise the monthly earnings very appreciably before the close of the current year.

The Working Cost Factor.

Working costs still rule at a high figure—they are no less than seven shillings per ton above the average for the whole Witwatersrand—and there is unquestionably plenty of scope for reduction and economy. But it must be remembered that the City Deep has had severe disadvantages to labour under. Many difficulties have had to be faced, and that they have been successfully overcome reflects the greatest credit on all connected with this important proposition, which is without doubt destined to be one of the most long-lived and profitable deeper level propositions of the Central Witwatersrand. That working charges will in the not far distant future witness sensible diminution is hardly likely to be disputed, and, although it may be found policy to work ore of lesser assay value per ton simultaneously with a decline in operating charges, the present satisfactory rate of earning per ton, or something closely approximating to it, is likely to be maintained.

A Comparatively High-grade Mine.

It must, too, be borne in mind that the City Deep is a comparatively high-grade proposition. At the end of last year the payable ore reserves on Main Reef Leader—excluding pillars—were 1,914,540 tons of the excellent value of 36s. 6d. per ton over a stoping width of 58 inches.

Returns to Date.

Taking everything into account, it looks then as if the City Deep's aggregate profit result for the current year will be substantially better than that of 1912. It will be recalled that 1912 in turn resulted in the earning of a profit more than double that announced in respect of the 1911 operations. We append hereunder a table which sets forth the results secured since the commencement of reduction operations:—

	Stamps.	Tons Milled.	Revenue.	Working Costs. s.	d.	Profit.
Year 1911 ..	90	349,713	£537,518	23	3	£130,914
Year 1912 ...	120	479,630	852,010	23	9	282,119
January, 1913	150	42,700	78,031	21	8	25,248
February ...	150	41,900	77,771	21	1	27,329
March	150	45,400	85,371	23	3	32,623
April	150	44,200	84,248	24	8	29,410

CAPITAL EXPENDITURE IN 1912.

Amounts Paid for Machinery and Materials—Last Year's Additions to Equipment.

III.—GOLD FIELDS, NEUMANN AND ANGLO-FRENCH SUBSIDIARIES AND THE E.R.P.M.

We hereunder continue our examination of expenditures incurred by Witwatersrand mines last year on capital accounts. In previous issues we dealt with expenditures incurred under this head by nine mines of the Central Mining and Investment Corporation group, with mines which are under the control of the Johannesburg Consolidated Investment Company and with the Brakpan Mines. We this week give particulars of additions to equipment and expenditures in connection with shaft sinking, etc., at certain subsidiaries of the Consolidated Gold Fields of South Africa, S. Neumann and Company and of the Anglo-French Exploration Company. We also append a statement of this aspect of the year's work at the East Rand Proprietary Mines.

Simmer Deep.

In accordance with the practice of the Consolidated Gold Fields Group, the Simmer Deep report contains an analysis of expenditure and extraordinary expenditure as at 31st December, 1912. Expenditure and transfers during 1912 amount to £62,155, of which ore reduction plant accounted for £55,176. Against this there is an item, " less credits, sales and transfers," £11,421. On living quarters £891 were spent during the year and a sum of £610 was disbursed on account of underground plant at the Milner shaft.

Jupiter.

At the Jupiter £78,576 were expended on capital and extraordinary accounts during the year ended with December last. This amount, however, included £5,855 on the sinking of the Catlin shaft, £7,509 on the Howard shaft, and £39,283 on mining development. Besides these items the largest charges incurred were in respect of the joint ore reduction plant, £8,631; extension of compressor plant, £6,056; Sirocco fan at the No. 8 level Catlin shaft, £1,929; pumping plant, Catlin shaft, £1,739; and pumping plant, Howard shaft, £1,292. On a condensing plant for the rockhoist at the Catlin shaft £1,409 was spent. As against these expenditures £50,612 is recorded under the head of "amounts written off and credits," £45,239 of this being in respect of development redemption.

Wit. Deep.

At this mine the capital expenditure incurred during 1912 amounted to £32,891. The following buildings were erected: European change house, east shaft, 47 feet 6 inches x 24 feet x 12 feet 6 inches; extension to coloured change house, east shaft, 21 feet x 10 feet 6 inches x 8 feet; installation of fire service at European hospital. The following plant was installed: The sands filling plant was extended by the addition of 540 feet of 24-inch conveyor belt, with necessary motors, shafting, etc., for driving, and one 6-inch Robeson sand pump and motor, 1,300 feet of 8-inch sands delivery pipe and 1,300 feet of 10-inch return water pipe, eight dewatering cones and a borehole 6 inches in diameter and 713 feet deep, to deliver sand to north section of mine near north boundary. Underground.—Pumping plant, east shaft, 18th level station: Two more 8-inch by 16-inch triple plunger pumps with 125 h.p. motors and 6-50 k.w. transformers were added to this station, making its capacity 2,500,000 gallons per 24 hours delivered to the 14th level. Six 50 k.w. transformers were added to the equipment at the 7th and 14th stations. A 6-inch water delivery pipe and an 8-inch pipe were installed in the east shaft from the 14th to the 18th levels stations.

At the Knight Central.

The following were the principal additions and improvements undertaken during the year: A new change room for native miners was built at the east shaft, and the one at the west shaft extended to accommodate 650 natives. The change room for Europeans at the west shaft was extended to meet the Company's requirements, and improvements and additions were made in the bathing arrangements at the east shaft change room. A fan for improving the underground ventilation was erected at the east shaft. A new 10½-inches centres, high speed, sliding, surfacing and screw-cutting gap bed lathe was added to the workshop equipment. Ten chain grate stokers were ordered for the boilers at the west shaft, and of these, two were completed and were at work at the end of the year. Improvements were made to the fire service, and several small jobs finished off.

East Rand Proprietary.

The actual expenditure incurred on " authorised votes " during the year amounted to £215,685. The allocation of the year's expenditure was as follows: Machinery, plant and buildings, £45,892; reduction plants, £48,920; property, quarters, etc., £21,281; shaft, including Hercules vertical shaft and underground equipment, £99,592; total, £215,685. The Superintending Engineer estimates that votes to the extent of £146,000 will be required for the year 1913.

Apex Mines.

The net capital expenditure on the gold section of this property was £72,686, distributed as follows: Development, £60,401; incline shaft, £4,129; underground conveyors, £7,284; pumping plant, £3,871; sundries, £3,958; total, £79,643; less credit to K.G.C.A. participation account, £6,957; total, £72,686. Two shaft ore-bins were completed during the year, at the 3rd level, and at the 4th level of the incline shaft, each bin having a capacity of about 120 tons. The 36 inch conveyor belt was carried 1,000 feet further down the shaft to draw ore from these bins, making a total length of 2,150 feet of conveyor belts operating successfully in the shaft. The shaft timbering was completed a distance of 1,500 feet to the bottom of the shaft, and the ventilating brattice carried down for 500 feet from the 4th level to the 5th level. The pumping plant was increased by the addition of two pumps placed at the 5th level, which are capable of delivering 10,000 gallons per hour each to the main sumps at the bottom of the vertical shaft.

At the New Kleinfontein.

The net expenditure on capital account for the year amounted to £77,728, analysed as follows: Shaft sinking, £26,311; Orient section, £5,199; increase to reduction plant, £39,263; electric winder, east subsidiary shaft, £4,313; electric plant, £4,663; new compressor, £2,826; sundries, £2,110; total, £84,685; less, credit to Kleinfontein Group Central Administration Participation Account, £6,957; total, £77,728. The estimated expenditure on excess development and capital account for the year 1913 is as follows: Excess development, £3,000; incline shaft, central, £2,000; incline shaft, east subsidiary, £9,000; Orient shaft, vertical, £872; Orient shaft, incline, Main Reef, £10,800; Kleinfontein power station (unexpended last year), £11,924; reduction plant, £5,588; underground electric pumps, £4,807; sundry, £600; total, £48,591.

Luipaardsvlei Estate.

The result of last month's operations is as follows:—60 stamps ran 27·890 days, crushed 16,910 tons of ore, yielding 1,914 ozs. fine gold. Three tube mills ran 29·153 days, yielding 850 ozs. fine gold. Sands treated, 12,170 tons, yielding 1,224 ozs. fine gold. Slimes treated, 1,740 tons, yielding 383 ozs. fine gold. Profit from operations, £2,304; sundry revenue, £900; total profit, £3,204; working costs, 19s. 1·492d. per ton crushed.

THE MANAGER AND STAFF OF THE AURORA WEST UNITED G M. CO., LTD.

Left to right. Sitting in Front : H. Higham (Junior Clerk).
First Row : H. H. Wyndham (Cyanide Manager), J. L. Blaine (Compound Manager), D. E. Baxter (Chief Surveyor), M. Lichtenstein (Business Manager), J. P. Ward (Manager), E. Williams (Engineer), G. Burns (Mine Captain), D. E. Damant (Battery Manager), A. Donald (Foreman Fitter).
Second Row : W. F. Marais (Assistant Compound Manager), S. F. Hendry (Chief Electrician), B. Boam (Accountant), J. Locke (Chief Assayer), A. S. Malan (Chief Timekeeper), H. Russell (Hospital Attendant), W. F. Schultze (Chief Storekeeper), R. Robson (Foreman Smith), H. B. Bull (Shift Boss), L. Barr (Shift Boss).
Third Row ; N. Rhodes (Sampler), C. A. Damant (Assistant Surveyor), S. G. Quin (Cyanide Foreman), W. G. McDonald (Foreman Carpenter), F. N. Impey (Assistant Timekeeper), L. J. Case (Head Sampler), G. Dickin (Assistant Assayer), M. W. Langley (Shift Boss).
Back Row : C. G. McEwen (Assistant Surveyor), F. Johnston (Shift Boss), W. Gonshall (Sampler), W. H. James (Battery Foreman), H. M. Goldberg (Assistant Storekeeper).

POSITION AT THE SHEBA.

An Improving Outlook—Important Developments in the Zwartzkopje and Intombi Blocks—Effect on Ore Reserves—Sinking the Intombi Shaft.

The greatly improved position of the Sheba Gold Mining Company has been one of the most satisfactory and pleasing developments of gold mining in the outlying districts of the Transvaal that has taken place during the past year or two. It will be recalled that for over a decade the name of this proposition—once one of the most profitable and famous mines in the Transvaal—was absent from the dividend-paying list. The resumption of profit-earning and distribution of dividends by this important company has had a marked effect on the Barberton district generally, and has assisted in restoring a certain measure of confidence in the De Kaap gold fields. Since the resumption of dividend payments the following dividends have been paid: No. 1, 5 per cent. for year ending 30th June, 1911; No. 2, 5 per cent. interim for year ending 30th June, 1912; No. 3, 5 per cent. interim for year ending 30th June, 1912; No. 4, 5 per cent. interim for year ended 30th June, 1912; No. 5, 5 per cent. interim for year ending 30th June, 1913; No. 6, 5 per cent. interim for year ending 30th June, 1913.

MUCH IMPROVED FINANCES.

The greatly improved financial situation of the Sheba is reflected in the last annual report of the concern, which showed that the net result of operations for the year ended June 30th last, after deducting all charges at the mine, was that a profit of just under £50,000 was earned, and that £67,000 was carried forward. Out of this latter sum the company was enabled to distribute £40,461 in dividends—there being three declarations, each of 5 per cent. The reserve fund was brought up to £12,000, and the balance carried forward to the current year amounted to £16,414.

RECENT RETURNS.

Since the conclusion of the financial year the results secured have continued satisfactory. Statistics of ore, ore milled, production, working cost and profit, as declared to the Chamber of Mines each month, are as follows:—

1912	Stamps Working.	Tons Milled.	Output. £	Output. Per Ton. s.	Output. Per Ton. d.	Working Costs. £	Working Costs. Per Ton. s.	Working Costs. Per Ton. d	Profit. £	Profit. Per Ton. s.	Profit. Per Ton. d.
July	70	6,500	13,550	41	8	8,730	26	10	4,819	14	10
August	65	5,660	13,588	48	0	8,680	30	8	4,876	17	3
September	65	5,860	13,724	46	10	8,331	28	5	5,226	17	10
October	60	5,920	13,418	45	5	8,510	28	9	5,044	17	0
November	40	4,250	12,688	59	9	8,028	37	9	4,726	22	2
December	55	4,900	14,234	58	1	7,896	32	3	6,336	25	10
1913.											
January	60	4,850	13,877	57	3	8,559	35	4	5,319	21	11
February	65	5,500	12,586	45	9	8,458	30	9	4,128	15	0
March	—	6,220	12,811	41	2	8,566	27	6	4,246	13	8
April	—	6,340	—	—		—	—		4,716	13	8

In addition to its output from the Sheba property, the company has a half interest in the Rosetta. From this source a profit of £1,263 was derived in the year ended with June last. The latest developments at the property are of a highly satisfactory nature, and augur well for the maintenance, if not increase, of the monthly earnings disclosed in the above table.

THE ZWARTZKOPJE SECTION.

In the Zwartzkopje section of the property gold was discovered in a quarry some years ago, and recently this portion of the proposition has received chief attention from the management. The outstanding feature of the Zwartzkopje block may be described as a chert bar dipping at about 80 degrees. In places this bar is highly mineralised. It is underlaid by a lenticular fracture in schist, and it is on this body that for some time past development has been proceeding. In places this body carries very high values, especially where the quartz comes in contact with the chert bar. Fresh levels have been cut from the old shaft, and at several points these have exposed ore of highly profitable character. A winze has been put down below the seventh to the eighth level, and has been in ore of highly satisfactory value. From the eighth level a winze is being sunk to the plane of the ninth. For the first 20 or 30 feet the assays were high. A poor patch then intervened, and now ore of excellent value has again been encountered. In this Zwartzkopje section, too, excellent results have been obtained in a crosscut from the third level.

THE INTOMBI BLOCK.

Five hundred feet above the collar of the Zwartkopje shaft (the country is hilly and rugged), and considerably to the west of it, interesting and highly encouraging developments are attending work on what is known as the "Intombi fracture." This lies to the south of the chert bar, previously referred to. In former operations the Intombi fracture was found to average between 3 and 4 feet in width, and to yield about 10 dwts. per ton. The workings have been reopened, and at several points, notably on the 3rd, 4th and 5th levels, it has been found that the chute maintains its width and value. It has been decided to sink the shaft to meet the seventh level coming from the Zwartkopje section. About 260 feet of work remain to be achieved before this is done. When connection is effected, the ventilation will be much improved and the management will be able to push ahead with development at a much quicker rate than has hitherto been practicable. There has recently been put in a crosscut from the seventh level of the Zwartzkopje block to intersect the Intombi fracture, 650 feet below the previous deepest workings, and it is highly encouraging to learn that the width and values remain the same—that is to say about 10 dwts. per ton over a width of between 3 and 4 feet.

EFFECT ON ORE RESERVES.

Needless to state, these several developments are of the highest importance, not only to the company but to the Barberton district generally. The management should soon be able to record substantially better ore reserves than were announced in the last annual report, and in the near future there should be ability to increase profits. In regard to the ore reserves, it may be recalled that in the last manager's annual report these were stated to be as follows:—Zwartzkopje mine, 105,000 tons, estimated screen value 12 to 15 dwts.; Insimbi mine, 15,000 tons, estimated screen value 7 to 8 dwts.; Intombi mine, 2,000 tons, estimated screen value 6 to 8 dwts.; Southern Cross mine, 5,000 tons, estimated screen value 10 to 12 dwts.; total, 127,000 tons. In a few weeks' time the tonnages blocked out will be recalculated, and, although Mr. G. C. Fox, the consulting engineer, and Mr. H. B. White, the general manager, may not see fit to include all the new blocks referred to above in the new estimate, it may be presumed that the next annual official document will record a substantial improvement in the ore reserve position.

Considering the extensive claim area owned by the Sheba Company, its large plant, and the small amount of its capitalization (£300,000 nominal, divided in 1,200,000 shares of 5s. each, of which 1,078,954 are issued = £269,738 10s.), the position of this company is remarkably sound, and the concern should have an excellent future.

MINE SAMPLING AND ORE VALUATION, WITH SPECIAL REFERENCE TO THE WITWATERSRAND AREA.—III.

[By Arthur S. Lejeune.

Chapter III.—Averaging of Assays, etc.

The averaging of assay values necessarily differs from the averaging of arithmetical quantities, in so far as the width of each individual sample must be taken into account. Obviously, a sample assaying, say, 100 dwts. over a width of 10 inches, averaged with another assaying 10 dwts. over 6 inches, does *not* give us 8 inches of reef assaying 55 dwts. The method adopted to average the above samples is as follows:—Multiply each individual assay by the corresponding number of inches. This gives a figure which is for the sake of convenience called "assay inches" or "inch dwts." Then add the number of inches together and divide the total by the number of sections. This gives the average inches of reef. Now divide the total inches into the sum of the "assay inches" and so arrive at the average value. Taking our example above we get:—

10 inches × 100 dwts. = 1,000 assay inches.
6 inches × 10 dwts. = 60 assay inches.

Total 16 inches 1,060 assay inches.
16 divided by 2 = 8 inches of reef.
1,060 divided by 16 = 66·25 dwts. = average value of reef.

In a similar way, if the total assay inches be divided by the sum of the stoping widths the result will be the average value over the average stoping width, or the average stope value. Another value is very often required, namely, the milling value.

Milling Width is the term applied to the figure representing the stoping width minus the amount of waste rock sorted out, *e.g.*, if the stoping width be 60 inches and the percentage sorting 10 per cent., the milling width will be 60 minus 6 inches = 54 iches.

Milling Value is the average value of the stope over the milling width and is inversely proportioned to the widths, *e.g.*, if the stoping width of a stope be 60 inches and the average value over this width be 7·0 dwts., then the average milling value over a width 54 inches will be:—

$$\frac{7{\cdot}0 \times 60}{54} = \frac{420}{54} = 7{\cdot}8 \text{ dwts.}$$

The figures, milling width and value, are very important in the estimating of the gold recovery, as will be shown later. The following represents the booking of a stope, and clearly indicates the method of averaging it:—

Stope No. 11 West 1 West Face.

Distance.	No. Section.	Sample No.	Reef.	Waste.	Reef Value.	Assay Inches.	Section Width.	Section Value.	Stoping. Width.	Stoping. Value.
				12						
		1	6		21·0	126				
				8						
10ft. down		2	10		12·5	125				
				5						
		3	3		6·0	18				
				6						
	1		19	31	14·1	269	32	8·4	50	5·1
				20						
30 ft.		4	8		20·0	160				
				5						
		5	8		8·0	64				
				6						
		6	7		10·5	73				
				4						
	2		23	35	12·9	297	34	8·7	58	5·1
				15						
		7	9		18·0	162				
				3						
50 ft.		8	10		14·5	145				
				4						
		9	12		6·5	78				
				8						
	3		31	30	12·4	385	38	10·1	61	6·3
				5						
		10	10		24·0	240				
				6						
70 ft.		11	10		5·0	50				
				4						
		12	5		12·0	6				
				4						
	4		25	19	14·0	350	35	10·0	44	8·0
Averages and Totals	4	Average Total	24·5 98	115	13·3	1,301	34·8 139	9·4	53·3 213	6·1

It will be seen that a new quantity, viz., "section width," has been introduced. The term "section width" is applied to the sum of the reef widths, plus the *dividing* bands of waste. These dividing bands are called partings. Thus, "section width" is reef plus partings. Explanation of the foregoing table:—It will be noticed that each sample width is multiplied by its corresponding assay value. The totals are then taken of the reef widths and waste widths, and the sum of these two is the stoping width. The section width as already explained is the sum of the reef and partings. Now, in each section the total reef inches is divided into the sum of the assay inches to get the average reef value. Similarly the sum of the assay inches is divided by the section width and stoping width to get the section width and value. Finally, the sums are taken of the reef widths, waste widths, section widths, stoping widths and assay inches. These totals are divided exactly as before to get the average reef width and value and average section and stoping widths and values. Here the averages are as follows:—Average reef width, 24·5 inches; average reef value, 13·3 dwts.; average section width, 34·8 inches; average section value, 9·4 dwts.; average stoping width, 53·3 inches; average stoping value, 6·1 dwts. It will be noticed that in this example all figures are calculated to one decimal place only and this should be sufficient for all general purposes. In some cases samples are taken at irregular intervals, and in this case the following procedure is necessary:—

Section.	Interval. feet.	Meef. width. ins.	Value.	Assay ins.	Feet ins.	Feet Assay. ins.
1	5	30	6·0	180	150	900
2	10	40	4·0	160	400	1,600
3	8	20	7·0	140	160	1,120
3	23	90	5·1	480	710	3,620

The reef widths are again multiplied by the assays, but this time both the assay inches and reef widths are multiplied by their respective intervals to obtain feet assay inches and feet inches respectively. To now obtain the average assay value, divide the feet assay inches by the feet inches. By this method we get the value 5·1 dwts., and by simply dividing the assay inches by the total inches we get 5·3 dwts. The average reef width is obtained in the same manner as before, viz.: $\frac{90}{3} = 30$ inches. Averaging development samples is performed in exactly the same manner, except that instead of an *actual* stoping width we get a *possible* stoping width based on the section width. The methods of estimating possible stoping widths are numerous. In all methods, however, there is a minimum fixed for this figure, some mines adopting 36 inches and others 24 inches. The former width would be more applicable to ore bodies of a high inclination. Where the section width does not exceed the minimum allowable stoping width minus about 8 inches the minimum is used. Should the section width, however, exceed this, the stoping width is increased accordingly. This will be best followed by studying the following example:—Section width, 24 inches; stoping width, 36 inches. Section width, 32 inches; stoping width, 40 inches. Section width, 12 inches; stoping width, 36 inches. Section width, 42 inches; stoping width, 50 inches. Section width, 38 inches; stoping width, 46 inches. In the above example the minimum possible has been taken as 36 inches. Some mines, besides setting a minimum, also make provision that no stoping width shall be greater or less than the preceding or succeeding width by more than a certain amount. Let us suppose this amount to be fixed at 6 inches. Our stoping widths would then appear as follows:—Section width, 24 inches; stoping width, 36 inches. Section width, 32 inches; stoping width, 40 inches. Section width, 12 inches; stoping width, 44 inches. Section width, 42 inches; stoping width, 50 inches. Section width, 38 inches; stoping width, 44 inches. In calculating an average of several stopes the procedure is exactly the same as the foregoing, *e.g.*:—

Stope No.	No. of Section	Reef Inches.	Assay Inches.	Stope Inches.
1	10	372	1568	586
2	11	412	2174	732
3	10	378	1823	526
4	8	245	1117	401
5	4	191	728	321
6	10	421	1752	736
-	53	2019	9162	3302

Average reef width, 38·1 inches; average reef value, 4·5 dwts.; average stope width, 62·3 inches; average stope value, 2·8 dwts. Here the total sections, reef inches, stope inches and assay inches have been added together, and as before the total reef inches and stope inches divided by the number of sections give the average reef and stope widths respectively. Now dividing the total assay inches by the total reef and stope inches we get the average reef value and stope value.

(To be continued.)

Ceylon Lydenburg.

The following are the particulars of this company's output for the month of April:—Tons crushed, 662, yielding 315 fine ounces; estimated value of month's output, £1,306; estimated profit for the month, £697.

The fourth annual ordinary general meeting of the shareholders of the Ceylon Lydenburg, Ltd., was held last week, Mr. H. C. Boyd presiding. In moving the adoption of the report and accounts, the chairman said: The reports and accounts for the year ended the 31st of December, 1912, show that the profit earned to that date amounted to £12,613, out of which, after liquidating liabilities incurred prior to the commencement of milling operations and providing for the amount due under the profits tax, a dividend of £6,215 was paid, £2.573 being carried forward to this year's account. These results are certainly disappointing, compared with those which we have been led to expect from the reef values disclosed in the course of development. A circular was issued to shareholders last November covering a special report by the superintendent regarding the position of the mine. Experience of working the highly erratic reef, which we have opened up, has, unfortunately, shown that we cannot recover a grade commensurate with the comparatively high values indicated by the very thorough system of sampling and check sampling which had been carried out. The superintendent, in his report now before you, points out how necessary it is also to restrict the area regarded as proved by any development, and explains the basis on which the ore reserves at the 31st of December are calculated. These amounted to 1.016 tons, of an estimated average value of 11·15 per ton. It was estimated that during the first quarter of the current year 1,670 payable tons have been developed, worth 7·75 dwts. per ton. With a reef of this nature it is, of course, idle to attempt to prophesy what values will be disclosed by further developments, but at the moment it must be admitted that the prospects are unsatisfactory as regards the likelihood of discovering any further appreciable amount of payable ore in the small mine which we are at present working. Against this we must bear in mind that the section of our property which we have so far opened up is very small compared to the total area owned, and it is reasonable to expect that further discoveries of valuable ore remain to be made. To this end careful prospecting is proceeding, and we are now considering the advisability of testing certain portions of the property by a series of shallow boreholes. The profits for the first quarter of this year amounted to £2,288. No expenditure was incurred on capital account, and at the end of last month we had £4.006 in hand after providing for all liabilities. The report and accounts were adopted.

Sheba G.M. Co.

The following telegram has been received from the mine office regarding results for the month of April:—Sheba Mine: Mill ran 29 days, crushing 6,340 tons, yielding 3,178 ozs. of fine gold; estimated profit, £1,716. Rosetta Mine: No clean-up at end of April.

1912 AT THE GEDULD PROPRIETARY MINES.

Increase in Ore Reserves of 739,000 Tons—Installing New Equipment—Year's Total Profit, £56,996.

The reports of the directors, consulting engineer and manager of the Geduld Proprietary Mines together with the balance sheet and accompanying schedules as to development and plant, etc., for last year afford instructive reading. In view of the facts that the enlarged equipment is now practically completed and that in a few weeks' time the benefits resulting from crushing at the rate of 24,000 tons per month instead of 11,000 tons (the average for last year) should be evidenced in the returns, a special measure of interest attaches to the official statements issued by this company. The first matter referred to in the directors' report is the capital of the company. This at the end of 1912 was (authorised) £1,000,000, registered (all issued) £875,000. The report proceeds to discuss expenditure on capital account and shows that the amount disbursed under this head for the period under review was £71,840. The balance sheet shows a balance of cash and cash assets, payments in advance and stores after deducting current liabilities of £131,807 10s. 9d. Full and detailed reports by Mr. W. McC. Cameron, the consulting engineer, and Mr. L. A. Womble, the general manager, accompany the directors' statements. In the former report it is stated, *inter alia*:—

The reduction plant was kept running throughout the year to its full capacity, and the tonnage treated again increased by 29,900 tons over 1911. The yield at 26s. 8.8d. per ton milled remained practically the same as the previous year, while the working costs were reduced by 9.88d. per ton, a saving made largely underground, and working profits were increased by 9.6d. per ton milled. The total working profits, including sundry revenue, amounted to £56,996, as against £39,969 in 1911. A very large percentage of low grade ore from development work, 28.3 per cent. of the tonnage mined and approximately 34.3 per cent. of the tonnage milled, the waste discarded from this product owing to its fineness being much less than that discarded from stop ore, was sent to the reduction works during the year. This feature, while so much development work is being done and the reduction works remains at its present small capacity, has the effect of unduly reducing the yield per ton, but will be largely counteracted when the enlarged plant is brought into operation and the increased tonnage required is coming from stopes. The ore reserves were re-measured at the end of the year with results as follows: Developed. 1,175,000 tons of an assumed stoping width of 52.8 inches made available for mining by 24,990 feet of drives, raises, and winzes on reef. Average linear assay value of the above footage 6.98 dwts. over a stoping width of 52.8 inches. Of the above tonnage 130,000 tons are required to be left as pillars, and are unavailable for mining purposes at present. Indicated.—116,000 tons of probable ore by 2,015 feet of development work on reef. Average linear assay value of this footage is 5.79 dwts. over a stoping width of 52.3 inches. The development during the year has given very satisfactory results, and the developed ore reserves have been increased by 739,000 mining tons. The indicated ore is decreased by 115,000 mining tons because additional work in many of these blocks has resulted in their transference to developed tonnage. The development account as at December 31st stands in the books at £169,131 or 2s. 3.5d. per ton of developed ore, while 3s. 7.5d. per ton mined was written off in 1912 for development redemption. To a large extent the areas in which development work will be done during the coming year are promising, and there is good reason for assuming that the results will again be satisfactory. The favourable development of the mine made it possible early in the year to recommend an increase in capacity of the reduction works to 24,000 tons per month. The addition to the plant is now in course of erection, and should be ready for use in May, 1913. Advantage has been taken of this increase in reduction works capacity to alter the system of treatment somewhat, in order to secure a residue lower in gold contents, and it is confidently anticipated that this desirable result will be obtained. To the crushing plant 10 stamps and 4 tube mills are being added; sand will be collected on Caldecott tables; a larger percentage of slime from which a better extraction can be obtained than from sand, will be produced, and gold-bearing solution will be separated from slime by Butters' filters instead of by decantation as at present. The additional power required will be obtained by utilizing the exhaust steam from hauling engines and compressors in a mixed pressure turbine driving electric generators.

Mr. L. A. Womble, the manager, sums up the results secured as follows:—

Ordinary working costs, £138,276 18s. 9d.; cost per ton milled, 16s. 4.618d.; development redemption, £37,971; cost per ton milled, 4s. 6d.; total working costs, £176,247 18s. 9d.; cost per ton milled, 20s. 10.618d.; working profit, £49,338 16s. 1d.; profit per ton milled, 5s. 10s.167d.; value of yield, £225,586 14s. 10d.; value per ton, 26s. 8.815d. In addition to the above profits, sundry revenue to the amount of £7,657 7s. 10d. was earned, making a total profit of £56,996 3s. 11d.

MINING MEN AND MATTERS.

His many friends will regret to learn that Mr. T. Lommel, for many years manager of Messrs. G. Cradock & Co., Ltd., leaves for England by the R.M.S. Saxon.

* * * *

The Consolidated Langlaagte Mines, Ltd., have kindly extended an invitation to the S.A. Institution of Engineers to inspect the surface works to-day (Saturday). Brakes will leave the Institution's offices, corner of Loveday and Marshall Streets (Stewarts and Lloyds' Building), at 1.15 and 2 p.m. The Pretoria Portland Cement Company, Ltd., have invited the Institution of Engineers to inspect their works next Saturday, May 17th. A special train will leave Johannesburg station at 12.30, stopping at all stations to Germiston, and will travel direct to the company's siding. It will return to Johannesburg by about 6.30 p.m. Mr. E. Davidson, the manager of the company, will read a paper on "Cement Manufacture" at the May monthly general meeting which will be held on Friday, May 16th, instead of Saturday, May 10th.

* * * *

It is with much regret that we chronicle the death of Mr. Michael Dodd, the well-known and popular consulting engineer. Mr. Dodd was 55 years of age, and was born at Newcastle-on-Tyne, where he formed a life-long friendship with the Hon. Thomas Burt, Labour Member in the House of Commons for Morpeth. Both had much in common, each having been born in the vast industrial centre of England's northern coal fields, and had experience of the perils and hardships of the miner's life. Mr. Dodd came to South Africa after the war, and soon became prominent as a mining and consulting engineer. Latterly, he was consulting engineer for the Worcester Exploration Company at Barberton. He was at one time manager of the Transvaal Coal Owners' Association, indeed one of the founders of it. In matters appertaining to the coal industry, Mr. Dodd was an expert and his advice was sought on all occasions of policy and development. His services were employed after the disastrous explosion at Vereeniging four or five years ago, and he was much in request by colliery owners in Natal.

Federation Co.: Rights for Sale.

In execution of a judgment of the Supreme Court of South Africa, a sale will be held in front of the Magistrate's Office at Johannesburg to-day of all the right, title and interest of the Federation Company, Ltd., in and to certain agreement or lease dated 24th April, 1888, made between Johannes Andries Muller (acting as the duly authorised agent of F. J. Bezuidenhout, sen.), of the one part, and Jan Eloff and W. B. Shurmer, of Johannesburg, of the other part, relating to the farm Doornfontein, situated in the district of Heidelberg, the rights of the said Shurmer under the said agreement having been ceded to the said Federation Company, Ltd., on the 9th July, 1909.

MARCH YIELD, COSTS, AND PROFITS.

Chamber of Mines' Analysis.

THE usual monthly analysis of the gold production for March issued by the Chamber of Mines is presented hereunder :—

THE WITWATERSRAND.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West United ...	18,796	26	5	20	4	14,500	4,289	6	0
2. Bantjes Consolidated ...	40,413	27	0	21	11	32,707	7,159	4	9
3. Brakpan Mines	81,153	29	2	18	3	50,349	30,116	10	11
4. Cinderella Cons.	23,872	26	0	26	8	24,445	*454	*0	6
5. City Deep	87,393	38	0	23	7	53,539	31,831	14	0
6. City and Suburban ...	52,375	38	11	21	6	28,935	22,846	17	0
7. Cons. Langlaagte	59,362	27	11	18	9	39,322	20,040	9	7
8. Cons. Main Reef	33,723	29	11	19	9	22,320	11,077	9	10
9. Crown Mines	299,520	29	10	16	9	168,059	128,206	12	9
10. Durban Roodepoort ...	15,186	21	2	15	9	11,112	4,021	5	8
11. Durban Rood. Deep ...	38,374	30	2	24	6	31,231	6,744	5	4
12. East Rand Proprietary.	255,811	30	4	19	3	156,457	91,054	11	3
13. Ferreira Deep	122,275	44	2	20	0	55,061	65,327	23	8
14. Geduld Proprietary ...	17,509	23	10	22	0	15,725	1,714	2	5
15. Geldenhuis Deep	87.372	30	3	24	4	70,273	16,150	5	7
16. Ginsberg	20,869	27	1	19	3	14,523	6,345	8	5
17. Glencairn Main Reef ...	16,885	15	0	13	3	14,072	2,814	2	7
18. Jumpers-cum-Treasury .	12,756	39	10	40	10	11 284	1,505	5	5
19. Jupiter	46,177	20	10	16	9	37,084	5,003	2	3
20. Knight Central	26,663	20	8	18	6	23,825	2,512	1	11
21. Knights Deep	82,274	14	9	10	4	56,928	24,418	4	5
22. Langlaagte Estate ...	59,243	19	4	16	6	45,619	15,000	5	5
23. Luipaardsvlei Estate ...	18,766	22	6	19	5	16,168	2,401	2	10
24. Main Reef West	30,694	29	2	22	1	23.208	7.261	6	11
25. May Consolidated	15,330	19	7	14	5	11,283	4,012	5	2
26. Meyer and Charlton ...	33,684	46	5	18	0	13,053	20,562	28	4
27. Modderfontein B. ...	66,192	37	7	15	7	27,493	37,995	21	7
28. New Goch	28.277	20	0	15	6	21,926	6,323	4	6
29. New Heriot	20,398	34	10	21	8	12,147	8,023	14	4
30. New Kleinfontein	73,205	28	4	18	5	47,500	25,002	9	8
31. New Modderfontein ...	102.192	39	0	19	9	51,334	48,986	18	10
32. New Primrose	36,271	28	0	13	10	17,553	18,720	14	10
33. New Rietfontein	18,898	22	6	18	11	15,912	2,987	3	7
34. New Unified	16,800	26	6	18	10	11,742	5,059	8	1
35. Nourse Mines	84,475	31	5	21	4	56,765	26,811	10	1
36. Princess Estate	29,250	25	5	23	11	27,253	1,902	1	8
37. Randfontein Central ...	282,160	23	11	16	10	197,154	81,588	7	0
38. Robinson	110,033	36	8	13	4	39,785	68,315	22	11
39. Robinson Deep	86,170	28	3	16	0	48,732	32,214	10	7
40. Roodepoort United ...	24,140	18	3	19	2	24,933	*744	*0	7
41. Rose Deep	94,911	27	2	16	5	57,307	36,624	10	6
42. Simmer and Jack ...	79,297	19	6	10	7	42,920	35,732	8	10
43. Simmer Deep	55,233	17	4	14	6	44,926	6,539	2	1
44. Spes Bona Tribute ...	6,359	19	11	—		—	—	—	
45. Van Ryn	50,009	25	3	15	3	30,253	25,127	12	8
46. Village Deep	73,443	28	8	18	10	48,130	24,770	9	7
47. Village Main Reef ...	71,269	36	1	18	3	35,378	33,717	17	5
48. Vogelstruis Estate... ...	16,333	22	4	18	10	13,298	3,060	4	4
49. West Rand Central ...	3,054	35	3	35	3	3,053	—	—	
50. West Rand Cons.... ...	43,501	29	5	23	10	34,820	8,727	5	11
51. Witwatersrand	50,251	25	11	14	11	28,962	21,288	11	0
52. Wit Deep	59,175	30	5	19	5	37,847	20,739	10	8
53. Wolhuter	36,365	25	8	18	2	25,580	10,329	7	4
Miscellaneous producers	15,516	—		—		—	—	—	
Witwatersrand totals	3,229,652	27	5	17	8	2043785	1121786	9	8
*Loss.				52 cos.		52 cos.	52 cos.	52 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

HEIDELBERG—									
1. Nigel	20,143	28	9	22	9	15,916	4,000	5	8
2. Sub Nigel	9,702	38	4	28	7	7,235	1,921	7	7
BARBERTON—									
3. Barrett	556	4	7	—		—	—	—	
4. Sheba	12 811	41	2	27	6	8,566	4,346	13	8
5. Worcester	5,004	16	8	12	10	3,865	1,112	3	8
LYDENBURG—									
6. Glynn's Lydenburg ...	8,249	44	9	18	7	3,440	4,510	24	5
7. Transvaal G.M. Estates	42,603	57	0	22	4	16,339	24,810	34	0
Miscellaneous producers	29,330	—		—		—	—	—	
Total (outside districts)	128,398	37	9	22	4	55,361	40,599	16	4
				6 cos.		6 cos.	6 cos.	6 cos.	
Grand totals	3358050	27	7	17	9	2099146	1162385	9	10
				58 cos.		58 cos.	58 cos.	58 cos.	

G.S.W.A. Copper and Tin.

According to German Consular reports, the Otjozongati mine, near Okahandia, has raised 500 tons for export. The extensive prospecting operations of the Hanseatic Mining Company, on the copper and copper-gold occurrences in the territory of the Bastards of Rehoboth have been given up, no payable ore deposits having been discovered. The Otavi Exploration Company raised 354 tons copper and copper-lead ores. The Henderson mine was closed down owing to unfavourable developments, and for a similar reason the development work carried out by the South African Territories, Limited, was temporarily stopped. Whether the gold occurrences near Korichas, in the territory of the Kaoko Land and Mining Company, will prove payable appears questionable. The operations of the Sphinx Mining Syndicate, which in February, 1912, entered into liquidation, and the development works on the Kuibis goldfield, generally speaking, remained without any results worth speaking of. The tin occurrences are situated in the Karibib, Omaruru, and Swakopmund districts. They extend over a remarkably large area. The most extensive deposit is situated east and south-west of the Errongo; another one occurs west of the Okombahe, and a third east of the Brand Hills. The tin ore occurs exclusively in pegmatite lodes, which are confined to schistose mica formations. The highly micaceous portions of the pegmatite lodes have proved to be richest in tin; large tinstone lumps weighing 500 kgs. and more are derived from them. From the prospecting and development works hitherto carried out, it appears probable that in most cases the mineralisation of the lodes, which near the outcrop is often as little as 5 or 10 m. On the Neineis alluvial fields machinery is being more and more largely introduced for the ore reduction works. In the territory of the Kaoko Land and Mining Company several rich and very extensive magnetite iron ore deposits have been opened up. Furthermore, a mottramite occurrence has been discovered by the South-West Africa Company on the farm Rietfontein; from 15 to 20 tons were raised from it. New prospecting work for lead ore was in progress only in the concession of the South African Territories, near Aiais. On the farm Karions, and particularly near the Little-Karras railway station, wolframite deposits have been discovered, part of which seem to offer good prospects. The South-West African Mining Syndicate has transferred the greater part of its tinfields to the Otavi Exploring Company. The syndicate's mining laboratory was taken over by the German Government, and transferred from Swakopmund to Windhoek.

Roberts Victor.

The following was the result of the working of the Roberts Victor Mine for the month of April: Loads washed, 5,002; recoveries, 2,465¾ carats. Owing to the heavy rains, washing operations were suspended on the 19th April in order to remove reef and prepare, on resumption of washing, for the treatment of larger quantities. Washing will be resumed shortly.

ROOM AT THE TOP

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics. — E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, corner Eloff and Pritchard Streets; Box 2061.

Rhodesian Section.

LATEST MINING NEWS.

The Budget Speech—Miners' Phthisis Ordinance—Giant Mines—Railway Returns—Sleeping Sickness and Recruiting—Salisbury Rumours—The London and Rhodesian Company—Origin of the Somabula Gravels.

IN the course of his Budget Speech, delivered before the Legislative Council last week, the Treasurer said there "had set in a change in the methods of our mining adventurers. I do not mean to use the word 'adventurers' in a bad sense; shall we say our mining magnates? A certain amount of capital was withdrawn, let us hope only temporarily. There was some reduction in capital, some changes of method, while prospecting diminished appreciably. There was a general falling off in the initial stages of new mining ventures. Of course, it is perfectly understood that active development is going on in the case of several well-known and well-tested properties, but there is not as much going on as could be wished. There is a tremendous reduction in the expenditure of mining capital throughout the country. It was being felt in the mining revenue and in the telegraph receipts, and, no doubt, in fifty other ways."

* * * *

In the Legislative Council last week, the Miners' Phthisis Ordinance passed its third reading, as also the various clauses and preamble having been agreed to without amendment, did the Mining Inspectors' Powers Ordinance.

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The report of the Giant Mines for the quarter ended December 31st last contains the following:—Driven, sunk and risen, 978 ft.; ore developed at October 1st, 210,583 tons; ore crushed, 31,096 tons; ore in sight at December 31st, 179,487 tons; yield, 10,956·274 ozs.; cost per ton crushed, 13s. 8·767d.; estimated working profit, £25,124, or 16s. 1·911d. per ton; capital expenditure, £3,220.

* * * *

It has been decided to release the sleeping sickness area on the Luangwa from quarantine, and to allow natives to come south under certain restrictions, as it was impossible to police the boundaries effectually, and it was realised that it was better to bring natives down under control than allow them to break quarantine and wander down of their own free will. The Luangwa has, therefore, again been thrown open to recruiting; but all natives recruited from this area are brought to a medical camp situated at Fundu, on the southern limits of the known sleeping sickness area, and are there detained for a fortnight and kept under medical observation. Up till now this system has proved successful and satisfactory.

* * * *

The *Rhodesian Mining Review's* Salisbury correspondent states:—

"On Thursday last some excitement was caused in town by the arrival of a gentleman in hot haste from the Jumbo Mine, bent on buying Jumbo shares for all he was worth. He stated that the old Jumbo reef had again come to light at the lower level, and he amused the people to whom he divulged the secret by vigorously "talking up" the shares to 10s. But the local stable disclaims all knowledge of the alleged discovery, though the fact remains that the gentleman in question managed to secure some 2,000 shares, at an average price of a trifle over 11d. per share. One or two orders were also sent to London, and on Friday morning 1s. 1d. was the quotation cabled from Throgmorton Street. Rumours of this nature, however, especially when they are officially contradicted, should be received with caution; though it is, of course, by no means impossible that there may be more in the report than even the Jumbo people themselves may be aware of. At the same time it should not be forgotten that to buy Jumbo shares just now is attended with no difficulty; to sell them is a different matter. Accordingly, punters will be wise not to put too much reliance upon the report which has been so assiduously circulated during the last few days. A week ago we had a scare concerning the Eldorado Mine, which was evidently an ursine move. It was stated in London that the main shaft had fallen in, and a sudden drop in the quotation brought not a few inquiries by cable as to the meaning of it."

* * * *

A recent cablegram from the Salisbury to the London office of the London and Rhodesia Company contained the following:—"Radnor claims—East drive off No. 1 crosscut south, parallel reef from 15 ft. to 25 ft., assaying 16½ dwts. per ton over 44 ins. East drive on No. 3 crosscut south at 2 ft. in, assaying 16 dwts. per ton over 12 ins. Kelly's Option—40 ft. level—East drive at 35 ft., assaying 3 ozs. 8 dwts. per ton over 48 ins. West drive from 30 ft. to 40 ft. assaying 2 ozs. 4 dwts. per ton over 45 ins."

* * * *

Writing in the issue of *Rhodesian Mining Review*, under date April 30th, Mr. F. P. Mennel remarks of the origin of the Somabula gravels:—

"The deposits are quite unlike anything which could be ascribed to the action of the present-day streams. There is, in fact, no drift, like that of England, connected with the recent river system of Rhodesia, where the accumulations of coarse angular debris are very different from the alternations of gravels, sands, and brick-earths observed in Europe, besides being insignificant in amount. Even rivers like the Zambesi and Limpopo are almost devoid of alluvial deposits. The Somabula gravels and sands are, however, extremely similar, both in character and distribution, to the European river drifts, which are the alluvial deposits of rivers which have eroded their valleys to the lowest possible level, and have for long been chiefly occupied in widening them and spreading the materials furnished by the process evenly over their flood plains. The Somabula beds may therefore be set down provisionally as due to the action of an important Tertiary river or river stream, probably a feeder of the great lake which must once have filled the adjacent portion of the Zambesi basin, and draining an area of forest sandstone overlying the granite and schists which are now the chief occupants of the plateau. This long extinct river and its tributaries must have meandered over the sandstone of which that in the present Somabula Forest is the remnant, cutting channels in the sand and often excavating right down to the granite or schist bedrock. Meanwhile in reaches, etc., where conditions were favourable, the gravels and river sands which have since been exposed in the diamond workings were laid down in irregular layers and lenticles. It is very difficult to suggest the direction of the river's course. There are patches of redistributed gravel far away from the diggings at Willoughby's Spur and Ngamo; for instance, I may mention one on the north bank of the Kwekwe River near the drift on the Gwelo-Sebakwe road, which seems undoubtedly to be composed of materials derived from the Somabula beds. On the other hand, many supposed patches of Somabula gravel are nothing more than pebbly deposits derived from the basement conglomerates and gneiss of the Forest sandstones, beds altogether unconnected with the diamond bearing material. The furthest north where I am reliably informed that diamonds have been found is in a patch of gravel between the old Hunter's Road and the now abandoned site of the Somabula mission, which latter has now been removed to the east of the Forest. Even this patch, as far as could be judged from a hurried inspection, does not appear to consist of gravel really *in situ*. It would be interesting to know the precise character of the gravels lower down mentioned by Mr. Wilson in a recent *Bulawayo Chronicle*, as they might throw some light on the matter. That the Somabula beds are the remains of an extensive series of river gravels and sands, however, admits of no doubt, though the course of the river still leaves plenty of scope for speculation."

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

OFFICIAL REVIEW OF RHODESIAN MINING PROGRESS.

Points from Report of Secretary for Mines.

We hereunder publish the concluding portion of the report of the Secretary for Mines (Mr. E. W. S. Montagu) for the year 1912. The first instalment was given in our issue of last week:—

"The coal production amounted to 216,140 tons raised, of which 162,707 tons were sold for £73,268. The figures in 1911 were 212,529 tons raised, of which 161,824 tons were sold at £92,193. Gold, 642,807 ozs., value £2,707,369; silver, 176,532 ozs., value £20,010; lead, 588 tons., value £9,253; chrome ore, 69,261 tons, value £151,600; coal, 216,140 tons, of which 162,707 tons were sold, value £73,268; wolframite, 1 ton, value £100; total, £2,964,600. The number of stamps in use shows an increase of 104 stamps in the actual stamping capacity utilised. This is chiefly attributable to increase in crushing plant at some of the larger mines, but some new batteries of smaller capacity were erected during the year. The consensus of opinion is in favour of gravity stamps, and heavy Nissen stamps are being introduced into the country. Tube mills as auxiliaries are being more generally used on the mines. Great attention is being paid also to the best class of slimes and cyanide plants, in order to secure as large an extraction as possible. The stamps and other crushing power in 1912 were 1,803, as against 1,699 in 1911. The tons of quartz crushed for gold were returned at 1,538,038, as compared with 1,605,885 in 1911. The tonnage of tailings was 506,646, as against 731,412. In both cases a decrease may be noted, of 67,847 tons crushed and 170,766 tons of tailings. This decrease is accounted for by reasons which I previously explained, and also by smaller tonnage being dealt with by some low-grade propositions. The total gold won, inclusive of production from tailings, slimes and a small amount of alluvial, amounted to 642,807 ozs., valued at £2,707,369, being an average of 8·4 dwts. or 35s. per ton milled. The average for the previous year was approximately 7·8 dwts. and 33s. per ton milled. The 1911 figures recorded the highest average which had then been reached, so it is satisfactory to see that an improvement was again effected in 1912. Since 1907 the average has risen from 27s. per ton to 35s. in 1912. Some rich mines no doubt raise the general average, but on the other hand some low-grade ones with large tonnages have helped to keep it down, but I think there is little doubt that the better extraction of gold now being secured has helped to improve the average. It may be noted here that the total production of gold in the country to the end of 1912 was approximately £22,378,697. There was a heavy fall in the reef claims current at the end of 1912. The claims current on 31st December, 1911, numbered 131,374, but on 31st December, 1912, they were 88,298, or a decrease of 43,076 claims. In gold claims the decrease was 23,984, and in base minerals 19,092. The current claims on 31st December, 1912, may be classified as follows:—Gold claims, 77,488; tin claims, 6,035; copper claims, 2,567; lead claims, 560; aluminium claims, 380; graphite claims, 270; chrome ore claims, 265; asbestos claims, 260; iron claims, 240; antimony claims, 90; mica claims, 60; scheelite claims, 30; nickel claims, 30; azurite claims, 23; total, 88,298 claims. As far as gold claims are concerned, I anticipate a reduction in my previous report, as their numbers had been unduly inflated by peggings for purely speculative purposes, and the weeding out rather improves the position than depresses it, but the absence of capital during the past year has prevented sound prospecting work being carried out on some of the blocks current which show a fair promise of success. The stagnation of prospecting also militates against an increase in claims current. In base mineral locations the inflation in claim totals had occurred through the reported discovery of valuable deposits of tin, but though excellent specimens of cassiterite were obtained, and in many places short sections containing ore were exposed, a more permanent supply was not discovered, and a large number of tin claims went to forfeiture. The pegs were claimed on the chance of something good being discovered by the original discoveries of cassiterite. But tin is a mineral which requires a good deal of prospecting for, and although the excitement which was created in the first instance has died down work is still proceeding, and good results are anticipated. Twenty-three coal prospecting areas were current at the end of 1912 in addition to areas held under special grants. No serious work, however, was carried out, but some prospecting in Lomagundi is reported to have shown favourable indications, and more money will be spent during the dry season of 1913. Alluvial gold working was practically a negligible quantity, and alterations of the existing law, with a view to giving more favourable chances to peggers, are under consideration. I do not, however, anticipate any important alluvial fields, but some rivers are well worth washing for shed gold. A revival of interest occurred towards the end of the year in alluvial diamond washing at Somabula, on the area of ground held by the South African Options Syndicate, and 493 carats, valued at £2,051, were declared for Customs purposes. It is stated that operations on a large scale are in contemplation. A representative of the De Beers Consolidated Mines visited the country during the year, and spent some months in visiting spots where it was stated diamondiferous deposits indicating pipes existed, but I have no information as to the result of his enquiries. Development work for inspection purposes generally throughout the country shows a diminution, and this is accounted for by the difficulty in obtaining sufficient capital to thoroughly exploit ground which has already been pegged, but awaits systematic opening up. As I stated previously, a considerable amount of work is being carried out on some developing mines, but of this work only a small portion is declared for inspection purposes, sufficient to keep the claims current, whilst a large proportion is kept in hand for future use. With a fall in the number of claims registered, a decrease in work may also be expected. The graded footage declared in 1912 amounted to 335,860 feet, as against 349,470 in 1911, or a decrease of 13,610 feet. The footage may be divided up as follows: Gold claims 322,080 feet, and base minerals 13,780 feet. The latter marks an increase of 4,360 feet, and this may be considered satisfactory, as it points to greater attention being paid to base mineral locations. I may mention here that footage is not declared on the chrome claims at Selukwe, as they are held under special grant, under which footage need not be declared. On gold claims working for profit and paying claim licences, inspections by work are not called for by law, and no work is in consequence declared. Inspections by payment were taken out on 9,870 claims, viz., 6,103 gold claims and 3,767 base mineral claims. This shows a decrease of inspections by payment on 8,330 claims as compared with 1911, but I anticipate that such inspections will be even lower in the future, as money, where available, is more likely to be put into work. The position of inspection of claims by work and payment may be summarised as follows:—

	Inspected by Work.	Inspected by Payment.
Gold claims	63,280	6,103
Base minerals	11,850	3,767
Totals	75,130	9,870

"Special registrations show an increase of 195 claims, but this increase is disappointing, as special registration confers indefeasible title, and prevents any possibility of disputes in the future. The survey fees for special registration are not excessive, and it is strange that the conditions of the law are not taken more advantage of. The figures at end of 1912 were 4,849 claims, as compared with 4,651 at end of 1911. The claims discharged from the

British South Africa Company's interest numbered 5,665, as against 5,736 in 1911, and 5,323 claims were also discharged from work. The number of claims carrying continuous claim licences amounted to 3,331. Administrative receipts show a decrease, in comparison with 1911, of £8,201 This is chiefly attributable to the decrease in sales of prospecting licences, approximately £5,000, and to a smaller transfer revenue. The sale of prospecting licences compared with the previous year was disappointing, but it is a fluctuating revenue, and in 1912 was lower than usual. Registrations also showed a lower revenue of nearly £1,500, and as the sale of mining properties were restricted, the transfer revenue suffered. The mining revenue otherwise was much the same as in 1911, and a small increase in claim licences occurred The gross revenue collection totalled £42,752, as against £50,991 in 1911. Refunds of claim licences amounted to £3,795, leaving a net revenue of £38,957, as against £47,161 in 1911 The expenditure reached the sum of £21,583 (unaudited), as against £21,733, thus showing a small decrease."

THE KOLMANSKOP DIAMOND MINES, LTD.

Review of Results in 1912.

From the annual report of the general manager, submitted to shareholders at the fourth annual general meeting held on Saturday, the 29th March, we learn that the mining operations were this year conducted mainly in the valleys "Charlottenthal" and "Buschthal" and, to a lesser extent, on the western slopes of the "Annenthal." The latter place has this year been worked at for the first time. A general view of the area over which mining operations have been carried on is afforded by the topographical map of our fields, which has been revised and completed up to the 31st December, 1912. According to the same there have been entirely worked out: 1909, 30 ha.; 1910, 36 ha.; 1911, 44 ha.; 1912, 45 ha.; total, 155 ha. Partly worked out (surface layers): 1909, 28 ha.; 1910, 45 ha.; 1911, 70 ha.; 1912, 80 ha.; total, 223 ha. Of ground which has been prospected but not yet worked there still remains, at the end of 1912, about 775 ha. In addition to this, a large area has still to be prospected.

Labour.—The average number of workmen employed this year amounted to 40 whites and 450 natives. Although at the beginning of this year, especially in the months of January and February, the supply of labour had been satisfactory, it was scarce and disappointing during the rest of the year. This scarcity of labour made itself felt to such an extent that, in order to avoid a serious shrinkage of the output, a number of Cape boys had to be engaged at a higher wage than that paid to the Ovambos. The average wage paid to the natives, which had in the preceding year increased to M3 per diem, remained, therefore, the same, in spite of the fact that the health conditions among the natives were this year far better than last year. *Working Methods.*—In consequence of the aforementioned scarcity of labour, the mining operations could not always be carried out in such a manner as the systematic exploitation of the mining area would have demanded. At the commencement of this year work was carried on with three Schiechel machines and six hand-sifting gangs. Gradually, however, these gangs had to be reduced through lack of native labour, and towards the end of the year there were at times only three gangs at work. Already in February, when the first news of the negotiations concerning taxation on net profits made it seem probable that this system would be introduced during the business year, we commenced everywhere working the sand to a greater depth. To have been able to do this thoroughly we should have required, on an average, at least 550 natives, but, as this number was never attained, we were at times compelled to deviate from the mining plan in order to maintain the output. In such cases small gangs with hand machines were put to work at such places where deposits lay unfavourable for transport to the Schiechel machines, but which were diamondiferous enough to pay mining by hand. These hand machines, it is true, showed a loss of up to 30 per cent., but their tailings were always deposited in such a way that in times of scarcity of labour they could be more or less easily removed to the feeding track in order to go through the Schiechel machines. But still, this method entails expense which could be avoided if sufficient labour were at hand. The mining operations were naturally greatly handicapped through the burning down of Plant No. III. in Buschthal, on the 31st March last. Through an explosion of benzine on the night of the 31st March the plant caught fire and was completely destroyed. To counterbalance in some measure the unfavourable effect which this occurrence had on the output, several more hand-sifting gangs had to be formed and put to work in places where mining by hand was still profitable. Nevertheless, the output was decreased by that accident. This, and the scarcity of labour, are the chief reasons for the smaller output during the year. I may also mention here that three whites and about 35-40 natives were employed on the prospecting work which was instituted at the request of the Board of Directors at Capetown. This caused a further decrease of the labour available for mining operations. The new plant which replaces the one burnt down has been working since the end of November. It is constructed on a double-banked system, which means that the tailings which by the old system had to flow out from the first row of separators, are now once more worked through in a second row of separators, thus preventing all loss. As far as it is possible to judge after the few weeks the new plant has been working, it may be said that its work, in proportion to its higher cost, is thoroughly satisfactory. Whether an alteration of the other installations on the model of the new one is advisable or not, can only be ascertained after a longer working period and by means of exact comparisons. For working at a greater depth a sand dredger with a sieving device will shortly be in operation. This dredger enables working down to a depth of 6.5 meters—the greatest depth at which deposits have been ascertained, and works with more efficiency than the present hand-method. After the introduction of the dredger the cost of working at greater depths will become lower, just as was the case with cost of sieving operations after the erection of our new plant. There have been worked during this year:—635,000 loads mined (estimated) or 317,500 cbm raw sand (estimated), 211,486 loads washed (measured) or 105,743 cbm gravel (measured). The working costs were this year as follows:—M 1.15 per load mined, M 2.29 per cbm raw sand, M 3.44 per load washed, M 6,88 per cbm Gravel, M 5,93 per carat. In these costs no administrative charges nor allowances for depreciation are allowed. Out of the 105,743 cbm = 211,486 loads, about 30,000 cbm (60,000 loads) were tailings which had previously been worked once by hand machines. From them about 22,000 carats have been won. The average contents of the gravel amount this year to 1.16 carat per cbm. *Output.*—The output during the year was equal to a total output of 122,525 carats. As already mentioned, the output was unfavourably influenced partly by the burning down of the Schiechel plant in April last and partly by the scarcity of native labour. The size of the stones was on an average 8.7 per carat, consequently somewhat less than in the preceding year. This was chiefly due to the output during the months of January, February and March, during which Plant No. I yielded smaller stones in large quantities; the average size of the stones increased during the succeeding months. According to this the number of stones per 1,000 weighing ¼ and ⅛ carat has, compared with that of the preceding year, increased, whereas the other sizes have somewhat decreased. The quality of the stones is, on the whole, somewhat better than last year. This is proved by the price obtained—M22.45 per carat.

Prospecting Operations.—In June last the prospecting operations, instituted on instructions from the Board of Directors in Capetown, were started in order to approximately ascertain the quantity of diamonds contained in our property. I would however, draw your attention to the impossibility of making an exact estimate of alluvial deposits. Up to the present the prospecting results have, as a rule, always been surpassed by the mining results, and there are even fields belonging to other companies which, according to the prospecting results, were not worth working, and have yet later on, proved to be very rich. This may be explained as follows:—First of all, the results of the prospecting work depend more or less on the working methods of the employees that carry them out. If these people are reliable, and do their work exactly, the result is nearly correct. If, however, the contrary is the case, it becomes more doubtful. As only so-called "prospecting strips" and shafts are worked, the calculation for the whole area shows for every small mistake a considerable difference in its total, the prospecting results being, even when carried out ever so exactly, always smaller than the real output. *More* diamonds *cannot* be won at prospecting work, but very easily less. Even the best hand-machines, when used for working the prospecting strips, show losses of from 15 per cent. to 33 1-3 per cent., which naturally also influence the total results. By carfeul estimates a certain percentage may always be added to the prospecting results. I personally consider an estimate based on obtained mining results to be far more exact and correct. The value of the prospecting work lies, therefore, chiefly in the ascertaining of the diamondiferous deposits, thus giving a basis for the eventual mining work. During the last year and up to the date of this report only a part of our property altogether about 400 ha in extent, has been prospected after the usual method, through which operation the presence of about 400,000 carat was ascertained. Out of the 1,000 ha originally mentioned as payable ground there still remains to be prospected during 1913 about 300 to 400 ha, which work will probably be finished towards the middle of the year. It is expected, however, that from the remaining 3,000 ha of our property further parts will be proved payable by the development work. That is the reason prospecting work is being continued. According to my experience the prospecting results correspond only partly with the actual facts, and have hitherto been always exceeded, although I have employed the best and most reliable people for this work. The differences are the result of the above-mentioned unavoidable margin of error.

General Remarks.—The junction line to the railway station, Kolmanskuppe, the laying of which was commenced in 1911, has been completed this year. Consequently a great number of draught animals became available for mining purposes, which was of great value during the scarcity of labour, as it enabled the tailings to be brought over from the further situated places more conveniently. The water yield of all the wells has unfortunately somewhat decreased, forcing us to obtain a great deal of the water necessary for gravel washing—on an average about 250 cbm. monthly—from the "Koloniale Bergbau Gesellschaft." The reason for this decrease lies in the local conditions. None of the wells used are deeper than eight to eleven meter, and the water below the layer of sand rests on solid rock, which is waterproof. All deep borings near Luderitzbucht—we have also bored down to 200 feet—were unsuccessful. The brack-water is mostly found at lesser depths. As in the last few years no rains to speak of have fallen, these subterranean waters gradually disappear, the more so as they have no large feeding territory to begin with. The sand deposits, and especially the diamond-bearing gravels of our property, are likewise situated at a depth which is only limited by the solid rock below it. The greatest depth of gravel deposits in the lower part of Charlottenthal, as far as ascertained, was 6.5 meter. The dune-slope has, as hitherto ascertained, diamond-bearing gravel on its surface only (about 20cm), whereas the usually narrow strips stretching at larger depths through the drift-sand are to be considered "unpayable," on account of the huge masses of drift-sand covering them. The shafts, which have been sunk in two places of the slope across the direction of the dunes, have a depth of 10-18 meter. In the course of next year the bottom part of the dunes, the lowest valley-slope, will likewise be opened up by means of shafts, and the presumption that the leading diamond-bearing layer will be met with will probably be justified. The introduction of the new tax will, it is true, make a more systematic exploitation of the property possible, but the tax is still so high that the expectations of the diamond producers remain unsatisfied. As by the progressive system of taxation every technical progress and the cheapening of the working costs are being indirectly taxed, the desire of the diamond producers for a just and moderate tax is still unfulfilled. At all events, the working method must also now adapt itself to the taxation policy, and such a method is always in contradiction to a systematic exploitation of the mineral wealth.

QUARTERLY REPORTS.

New Unified.

Revenue, £48,147, or 26s. 0·830d. per ton from 35,890 tons milled; cost £34,226, or 19s. 0·073d. per ton; profit, £13,920, or 7s. 0·757d. per ton; total yield, 11,334 ozs.; capital expenditure, £899. Working costs were reduced by 1s. 2d. per ton as compared with the returns for the preceding quarter. There was an increase of 1,255 tons in the amount of ore crushed, so that although the revenue from gold was less by 1s. 9d. per ton the gross profit was only reduced by £571. The reduction in grade is due to the increased percentage of South Reef mined. Most of the development work was done on the South Reef, and, taken as a whole, the values exposed have been quite satisfactory.

Government Gold Mining Areas.

South-East Shaft: This shaft was sunk 293 feet, attaining a total depth of 3,372 feet. The quantity of water baled was very heavy, amounting to about 235,000 gallons per day, and this greatly retarded the rate of sinking. The shaft was in dyke at the beginning of the quarter, and quartzite came in at 3,086 feet. Several small stringers of reef were passed through between 3,185 feet and 3,265 feet. The shaft is still in quartzite. South-West Shaft: This shaft was sunk 453 feet, attaining a total depth of 2,966 feet. The shaft was in quartzite to 2,769 feet. At this depth a dyke (quartz porphyry), 13 feet thick, was passed through. Quartzite then came in and continued to 2,854 feet, when a diabase dyke was encountered, and the shaft continued in this dyke during the rest of the quarter. North-East Shaft: The total footage driven, risen and sunk during the quarter was 1,889 feet, of which 858 feet were on payable reef, averaging 20 inches width and 14·3 dwts. value; 585 feet were on unpayable reef, averaging 9 inches width and 10·9 dwts. value, and 446 feet were off reef. North-West Shaft: The total footage driven, risen and sunk during the quarter was 2,900 feet, of which 1,132 feet were on payable reef, averaging 26 inches width and 12·9 dwts. value; 1,086 feet were on unpayable reef, averaging 16 inches width and 3·8 dwts. value, and 682 feet were off reef. The general and assay offices were completed during the quarter, and the erection of 24 more single rooms was commenced. About 100,000 eucalyptus trees were put in on the north side. A 30-inch Sirocco fan was installed in the north-west shaft, and has greatly improved the working conditions. The capital expenditure during the quarter amounted to £60,829 11s. 8d.

Consolidated Langlaagte.

Revenue, £170,275, or 27s. 0·177d. per ton from 125,310 tons milled; cost £116,574, or 18s. 0·606d. per ton; profit, £53,701, or 8s. 0.571d. per ton; total yield, 40,086 ozs. The expenditure on new work at the southern section amounted to £7,172 5s. The quantity of ore milled was increased by 14,735 tons, and the revenue from gold showed an improvement to the extent of 1s. 4d. per ton as compared with the quarter ended December 31, 1912. As a result, the gross profit was increased by £15,572. During the period under review, the reduction plant was subjected to frequent stoppages owing to interruptions in the Victoria Falls power supply. The east shaft was sunk 16 feet to a total depth of 2,718. Sinking was stopped temporarily to permit of the ninth level station being cut. A cross-cut south of the reef was started at this level, and attained a distance from the shaft of 59 feet. The bulk of the development was carried out on the southern section, and ore of fair average grade was exposed. By the redemption of the balance of £50,000 debentures at March 31, the whole of the liability on debenture stock becomes extinguished.

New Primrose.

Revenue, £105,571, or 28s. 0·688d. per ton, from 73,600 tons milled; cost, £51,448, or 13s. 0.892d. per ton; profit, £54,448, or 14s. 0·796d. per ton; total yield, 24,853 fine ounces; capital expenditure, £1,056. The tube mill plant was put into commission in January, and this had a considerable effect on the returns for the quarter. Owing to the finer grinding of the ore, the revenue from current treatment was increased by 1s. 3d. per ton crushed, and as against this working costs were about 7d. per ton higher. The tonnage milled was less by 1,300 tons than the quantity milled during the preceding quarter. As was indicated in the annual report, there was a considerable reduction in the quantity of accumulated slime treated, the net revenue from this source being £858 as compared with £3,297 for the period ending December 31, 1912. Notwithstanding this, the gross profit was only £1,022 less than that for the previous quarter. A small amount of development is being carried out on the southern series, and one of the leaders of this series has shown improved values.

Situations Wanted.

TO MINE MANAGERS.

A practical and scientific miner, an expert in all branches of the profession, holder of mine overseer's certificates, coal and gold, seeks position as SHIFT-BOSS. Experience, 11 years Welsh Collieries, 19 years South African. Single, strict T.T., age 42 years. Interview granted. Apply Box 3637, Johannesburg.

TO MINE MANAGERS.

Thorough, practical man, 25 years in Modern Scottish Collieries, 12 years Under Manager and 4 years Manager. 1st and 2nd Class British Manager's Certificates for Union of South Africa, seeks official position in African Coal Mines. Age 41, married, strict T.T. First class references, and would like interview. Apply, Box 58, Germiston.

TO MINING COMPANIES AND SYNDICATES.

Gentleman with 20 years S.A. experience, seeks responsible position as Secretary or Storekeeper. Is a competent accountant and accustomed to business control and management. Highest references given. Country preferred, and distance no object. Just terminated agreement as Manager of Concession Stores and Hotel in country.

Replies to "R. J. 43," Central News Agency.

THE APRIL OUTPUT: GROUP RETURNS.

Features of Month's Work Reflected in Figures.

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of April:

Company.	No of Stamps Running.	Tube Mills.	Tons crushed	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep ...	300	7	68,810	16/5	23,530	£41,581
Geldenhuis Deep	300	7	60,300	23/5	21,211	18,480
Nourse Mines ...	260	7	52,000	22/7	19,432	22,669
Ferreira Deep ...	250	7	55,110	20/5	28,309	62,466
Crown Mines ...	660	26	196,600	17/0	69,937	126,812
Durban Rood. D	100	3	26,000	24/1	9,226	7,057
Totals & averages	1870	57	458,820	19/2	171,675	£279,065

The following are the results of crushing operations of Central Mining companies for the month of April:

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B. ...	80	5	31,020	16/3	14,414	£32,881
New Modder ...	180	7	52,200	19/3	23,719	49,558
City Deep ...	150	9	41,200	21/8	20,053	29,410
Village Deep ...	189	7	49,100	20/5	17,432	22,933
Village Main ...	220	6	38,300	18/6	16,778	31,326
Robinson	250	6	59,500	13/9	24,292	60,887
Bantjes	100	3	28,000	23/5	7,840	264
Totals & averages	1160	43	305,320	19/1	121,558	£230,259

Bantjes Consolidated Mines, Ltd. Reasons for abnormal results published 22nd April. Drop in grade and high working costs temporary and need cause no anxiety. Tonnage and grade satisfactory again, indicating normal rate of profit.

Barnato Group.

The following are the result of operations on the crushing mines of the Barnato group for the month of April:—

COMPANY.	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte .	100	45,300	£63,335	£22,258
Ginsberg	80	15,025	20,007	5,435
Glencairn	160	20,337	16,840	2,899
New Primrose	160	25,300	36,234	19,079
New Rietfontein	120	16,050	18,653	3,040
New Unified	60	12,305	16,652	5,194
Quest	35	3,957	3,318	301
Witwatersrand	220	36,920	51,452	21,141
April totals	935	175,194	£226,491	£82,350
March totals	930	175,500	£222,719	£81,152

Monthly gross profits for year 1913:—January, £79,198; February, £74,114; March, £81,152; April, £82,350.

Goerz Group.

The following are the results of operations of the crushing mines comprising the Goerz group for the month of April:

	No. of Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	15,330	£14,890	£4,081
Princess Estate	60	5	21,700	27,790	2,258
Geduld	50	2	13,800	18,244	2,518
	210	7	50,830	£60,924	£8,860

The monthly profits for 1913 are:—January, £15,117; February, £10,317; March, £8,554; April, £8,860.

The Albu Group.

The April operations of the producing mines of the group were as follows:—

Company.	Stamps.	Tube Mills.	Tons Crushed	Total Cost.
Aurora West ...	80	—	14,290	£11,829
Cinderella Consolidated ...	85	3	17,900	23,998
Meyer and Charlton	75	2	11,467	12,947
New Goch	120	4	27,800	22,759
Roodepoort United ...	50	3	26,865	23,915
Van Ryn	140	6	39,040	30,416
West Rand Consolidated ...	100	4	32,000	35,852
	645	22	172,362	£164,716

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	20/9·1	£18,847	£4,018
Cinderella Consolidated ..	26/9·8	22.178	*1,820
Meyer and Charlton	17/10·8	33,703	20,756
New Goch	16/4·5	27,896	5,137
Roodepoort United	17/9·6	25,304	1,389
Van Ryn	15/6·9	55,552	25,136
West Rand Consolidated ...	22/4·9	46,012	10,160
		£229,492	£66,596
Less loss			1,820
Net profit			£64,776

* Loss.

The profits for the first four months of the year are: January, £66,262; February, £58,056; March, £63,830; April, £64,776.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep	43,000	£63,966	£24,643
Wolhuter	28,900	37,330	11,104
Consolidated Main Reef ...	23,380	34,131	10,768
Main Reef West	21,180	30,752	7,124
Knight Central	25,420	28,369	3,188
Total for group			£56,827

The monthly profits for 1913 are:—January, £53,085; February, £46,112; March, £51,917; April, £56,827.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for last month of the undermentioned companies of the Consolidated Gold Fields group:

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit
Simmer and Jack ...	320	7	79,100	18,976	£40,780
Robinson Deep	160	10	58,300	19,132	32,623
Knights Deep	400	9	104,800	18,819	*23,482
Simmer Deep	180	9	65,950	12,762	6,661
Jupiter	120	6	43,100	10,518	4,861
Sub Nigel	20	1	4,700	2,373	2,822
Totals	1200	42	355,950	82,580	£111,229

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £2,500; Robinson Deep, £122; Knights Deep, £143; Simmer Deep, £461; Jupiter, £332; Sub Nigel, £388; total, £4,246.

*Knights Deep.—Of the total profit, £2,771 must be deducted in terms of circular to shareholders, dated 26th September, 1912.

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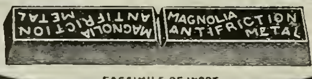

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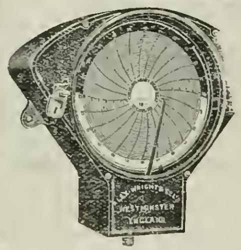

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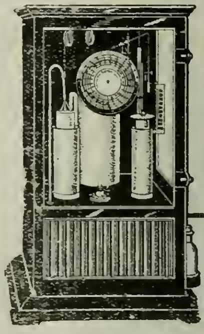

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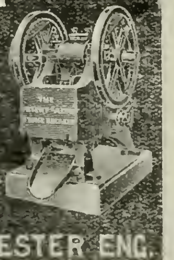

No. 00289 of 1912.

IN THE HIGH COURT OF JUSTICE.
COMPANIES (WINDING UP.)

IN THE MATTER OF THE COMPANIES CONSOLIDATION ACT, 1908,

AND

IN THE MATTER OF THE LANGLAAGTE PROPRIETARY COMPANY, LIMITED.

NOTICE IS HEREBY GIVEN that all persons claiming to be Shareholders of the above-named Company, or being the holders of Share Warrants issued by the said Company, are to send in their names, addresses and descriptions, together with the number or numbers of share warrant or share warrants and the number or numbers of share certificate or share certificates in the case of registered stock and in each case the distinctive numbers of the shares included in such share warrants or certificates so held by them to GEORGE JAMES VINCENT EMSELL, of 120 Bishopsgate, in the City of London, the Liquidator of the above-named Company, on or before the 31st day of July, 1913, and if so required, by notice in writing from the said Liquidator, are by their Solicitors or personally to come in and prove their claims at such time and place as shall be specified in such notice, or in default thereof they will be excluded from the benefit of any distribution to be made.

Dated this Eighteenth day of April, 1913.

WEBBER & WENTZEL,
City House, Harrison Street, Johannesburg,
Solicitors for the above-named Liquidator.

Engineering Notes and News.

STANDARDISATION OF ELECTRIC EQUIPMENT.

The following report prepared by the American Mining Congress Committee on standardization of electrical equipment in metal mines, was presented to the Spokane Convention and ordered to be printed in the *Bulletin* in order that the committee might have the advantage of any criticisms or suggestions through which their recommendations might be made more perfect. All persons are requested to make such suggestions to the chairman of the committee, H. S. Sands, Gas and Electric Building, Denver, Colorado. It is planned to follow with this report the same course followed by the committee on the standardization of electrical equipment in coal mines, whose report after the receipt of many suggestions was amended, and in its amended form has been adopted by the Legislature of Pennsylvania as a part of the State law. It is hoped that the report which follows, either in its present form or with such amendments as may be found desirable, may be made a part of the law in the metal mining States. The committee consisting of H. S. Sands, Charles A. Chase and Frank E. Shepard, states that it was their intention to compile a set of rules sufficiently broad to work no hardships on anybody and sufficiently exacting to bring about installations that would not only be safer but more economical and efficient than has been the general practice in metal mines. The committee is indebted to Dr. Rosca for his valuable work along similar lines. Copies of the preliminary rules were submitted to the following for criticism: D. C. Jackling, W. H. Staver, W. J. Canada, P. C. Schools and G. B. Rosenblatt, and many valuable suggestions made by them were incorporated with the proposed rules. The rules as formulated follow:—

Definitions.

The expression "pressure" means the difference of electrical potential between any two electrical conductors.

(1) *Low Pressure.*—Where the conditions of the system are such that the pressure between any two conductors, or between any conductor and the earth, at the terminals where the electricity is being used cannot exceed 300 volts, this shall be deemed a low pressure system.

(2) *Medium Pressure.*—Where the conditions of the system are such that the pressure between any two conductors, or between any conductor and the earth, at the terminals where the electricity is being used, can exceed 300 volts, but cannot exceed 600 volts, this shall be deemed a medium-pressure system.

(3) *High Pressure.*—Where the conditions of the system are such that the pressure between any two conductors, or between any conductor and the earth, at the terminals where the electricity is being used, can exceed 600 volts, this shall be deemed a high-pressure system.

Sec. 1.—Distribution System.

Rule 1.—Switching Station.—Where the generating station or sub station is more than 500 feet from the entrance to the tunnel or shaft, a switching station shall be installed at the entrance to the tunnel or shaft for cutting off the power from each circuit.

Rule 2.—Hoist.—The circuit feeding electric hoists used for raising or lowering men shall be separate from all other circuits and shall run from the distribution centre, and no other electrical apparatus shall be connected thereto.

Rule 3.—Lightning Arrestors.—Where the circuits entering the shaft house or tunnel are from an overhead transmission system each circuit shall be protected by lightning arresters, which shall be grounded to efficient grounds for that purpose.

Rule 4.—Grounding.—All alternating-current systems in which the normal working pressure does not exceed the limits of medium pressure, and all three-wire direct-current systems shall be grounded. In alternating-current power systems where the voltage does not exceed medium pressure and where the secondaries of the transformers are connected in star, then the neutral or centre of the star shall be grounded. Where the distribution system is delta or open delta, then the central point of one transformer shall be grounded. Where the distribution is three-wire direct current, then the neutral shall be grounded. The wiring for signal or telephone circuits shall be placed on the opposite side of the man-way, shaft or tunnel, from the power or light wiring.

Rule 5.—Underwriters.—All wiring shall conform to the rules of the National Board of Underwriters.

Rule 6.—Shaft Wiring.—All power wires whose pressure does not exceed medium pressure shall be run where possible in the man-way or the compartment of the shaft where hoisting does not occur, and shall be either lead armoured cable, or run in waterproofed or drained conduit. If the lead-armoured cable is used the insulation must be non-hydroscopic and as acid proof as possible. The cable shall be held in place by frequent fastenings spaced according to the weight of the cable so that the cable is firmly and securely held in place and there is no danger of the cable "dragging." The lead covering of the cable must be grounded. If the wires are run in conduit, junction boxes shall be placed at every level, and in no case shall the interval between boxes exceed 150 feet. These junction boxes shall be held in place and provision made to hold the weight of the wire in the conduit leading to the junction box below, on insulated supports. The iron conduit must be grounded.

Rule 7.—Power Wires.—All power wires whose pressure exceeds that of medium pressure shall be of either lead armoured cable or encased in iron or steel conduit or other approved non-hydroscopic conduit; in any case metal covering must be well grounded with wire at least one half the size of the largest wire in the cable or conduit.

Rule 8.—Joints.—All joints must be electrically efficient, mechanically strong, and soldered unless approved solderless joints are used. All joints except in trolley wires, should be taped or otherwise suitably insulated to protect them from corrosion.

Rule 9.—Bushings.—Where unarmoured cables or wires pass through metal frames or into boxes or motor casings, the holes shall be substantially bushed with insulating collars.

Rule 10.—Sectionalizing.—Wherever branch electric circuits leave a main or secondary feeder, cutouts and switches shall be provided for disconnecting the branch line from the supply line, and all main and distributing feeders shall be provided with sectionalizing switches at distances not exceeding one mile. All cutouts above ground to be in approved metal cabinets and under ground in subway-type cabinets.

Rule 11.—Switches, Circuit Breakers, Fuses.—All switches, circuit breakers and fuses must have bases of marble, slate or porcelain, or other suitable incombustible non-hydroscopic material, free from metallic veins, and shall be placed in as dry a situation as practicable.

Rule 12.—Circuit-Breakers, Fuses.—Fuses and automatic circuit breakers should be so constructed or adjusted as to open the circuit when the current through them exceeds not more than 100 per cent. of the working current in the case of motors, or by not more than 30 per cent. of the permissible current of the cables which they protect. Fuses shall be stamped or marked, or shall have a label attached indicating the current at which they are intended to fuse. Fuses shall be adjusted or replaced only by a competent person, authorised by the mine superintendent.

Rule 13.—Grounds.—The rails of the haulage system and the air and water pipes shall be connected together wherever practicable, so that the efficiency of the "ground" may be bettered, and where the formation is such that good electrical grounds cannot be obtained, then the tracks, and air and water pipes, shall be connected to a good and well-prepared ground at the mouth of the tunnel or collar of the shaft as the case may be.

Sec. 2.—Apparatus.

Rule 14.—Sizes and Capacity.—All electrical apparatus shall be sufficient in size and capacity for the work it may be called upon to do, and so installed, operated, maintained and safeguarded as to reduce the danger from accidental shock or fire or overheating to the minimum, and shall be of such construction and so operated that the rise in temperature caused by ordinary working will not injure the insulating materials.

Rule 15.—Grounding.—All electrical apparatus, that is, motors, transformers, generators, and their switching devices installed under ground shall have their frames well grounded.

Rule 16.—Portable Motors.—A higher pressure than medium pressure shall not be used for portable motors.

Rule 17.—Transformers.—Where pressure higher than the medium pressure is used in connection with transformers installed underground they shall be installed in a dry, well ventilated, fireproof room or compartment or station so arranged that it can be entirely closed with fireproof doors should any accident occur, and the fire arising from the accident be smothered.

Rule 18.—High-Pressure Motors.—No motors of less than 15 h.p. shall be used on circuits of higher than medium pressure.

Rule 19.—Switches and Fuses.—All motors, together with their starting resistance or induction starter, as the case may be, shall be protected by fuses and switches or by automatic circuit-breakers capable of entirely cutting off the current and these must be in sight of the motor.

Rule 20.—Trailing Cable.—In the event of the trailing or portable cable in service breaking down or being damaged, or of its inflicting a shock upon any person, it shall at once be put out of service and shall not be used again until it has been repaired and tested by the mine electrician or assistant mine electrician.

Sec. 3.—Electricians.

Rule 21.—Employment of Mine Electricians.—At every mine where electricity is used below ground, a competent mine electrician, and, where necessary, an assistant mine electrician also, shall be employed, subject to the authority of the mine superintendent. The electrician shall have full charge of all electrical apparatus used in connection with the mine. Every person appointed to operate any electrical apparatus in connection with a mine shall be instructed in his duty by the mine superintendent or electrician before taking charge of the apparatus.

Rule 22.—Inspection of Wiring.—It shall be the duty of the mine electrician to inspect all wiring and apparatus once every ten days, and once each month to make report of such inspections in writing to the superintendent, stating all defects found and how repaired.

(*To be continued.*)

Finance, Commerce, and Industries.

Exports to South Africa.

H.M. Trade Commissioner for South Africa reports that he has recently received complaints from importers in South Africa as to the manner in which quotations are made by some British exporting firms. It appears, one or two cases have recently come to his notice in which importers in South Africa, having based their calculations on c.i.f. quotations made to them by British firms, have found out on receipt of the invoice that these quotations did not include packing charges. It should be remembered that c.i.f. means that cost placed on board plus freight and insurance, and the omission, whether in a cabled offer or in a catalogue, of any item which goes to make up that cost should be stated, *e.g.*, "packing extra, so much," or, if necessary, "packing extra, estimated at so much." Attention is also called to the fact that duty in South Africa is levied on the "current value of the goods for home consumption at the place of purchase, including packing."

* * * *

Big Projects at Beira.

The outline of the form of municipal government that may, with the sanction of the Portuguese Government and the consent of the Mozambique Company, come into force at Beira is of a nature, says the *Post*, to suit the mixed population there. With a Board consisting of the Chief of Public Works, the Medical Officer of Health, and the Legal Adviser of the Company, five members selected from nominees of the different Associations, and three members chosen by the Governor who must not be members of the Mozambique Company, the interests of the town should be well served and safeguarded. Naturally, one of the first actions of the Board would be the raising of a loan for various improvements. Probably, the Mozambique Company will advance the £30,000 or so needful, for which the interest and amortisation might come through a small increase of duties on certain articles. The scheme of improvement which it is hoped the proposed new municipal organisation will be able to carry out embraces the macadamising of all the roads and streets in Beira for a width of five metres, leaving a strip of sand on each side to take off the rainfall. This, it is estimated, will cost about £12,000. A proposition is being prepared to supply the town with water, electric light and trams.

* * * *

Germiston Trams.

At the last meeting of the Germiston Town Council, the recommendations on the tenders for tram material were considered, very little discussion taking place, save on the first item: (a) the acceptance of Messrs. Hubert Davies & Co.'s tender for ten Cedes-Stoll cars at £11,400. A letter was read from Mr. H. Ainsworth, tenderer for the R.E.T. type, comparing the cable systems of the R.E.T. and Cedes-Stoll. Referring to a question on comparative running costs, Mr. Tait said the Cedes-Stoll was estimated at 4·61d. per car mile and the R.E.T. at 5·892d. An amendment to postpone the question for closer study was defeated by 8 votes to 6, and the recommendation was then put to the vote and carried by 7 votes to 6. It was agreed to purchase two spare wheels for these cars from Messrs. Hubert Davies & Co., at £312. The Connock's (S.A.) Motor Garage offer of a tower wagon for £875 was accepted, after an objection on account of the firm having accidentally omitted to fulfil a minor condition of tender on lodging same. There were seven prices submitted by different firms up to £1,075. The Telegraph Manufacturing Co.'s tender of £4,054 15s. 4d. for electric mains was accepted. There were nine tenders, the highest being for £5,456 14s. 6d. A supplementary report was submitted in regard to the electrical machinery, tenders for motor generators, rotaries and motor converters, and out of a total of seventeen in the different branches the tender of Messrs. S. Sykes & Co. for two 300 k.w. motor converters complete (no transformer necessary), including erection, engineer, lathe and motor, for the sum of £3,372 10s. was accepted. It was also agreed to buy from the firm a spare stator at a cost not exceeding £450. For overhead fittings, Messrs. Hubert Davies & Co.'s tender for £1,328 15s. 1d. was accepted, and the same firm secured the order for poles at a cost of £6,899 10s. 4d.

* * * *

Rhodesian Business Conditions.

An examination of the tables contained in the report of the Rhodesian Registrar of Deeds shows that of 2,642 deeds registered in 1912 (as against 2,264 in 1911) 988 were in respect of the transfer of stands and farms, 744 were bonds registered, and 361 bonds cancelled, while there were 223 marriage contracts (ante-nuptial). Only 15 joint stock companies were registered in 1912—12 fewer than in 1911. These—the majority were small mining syndicates—represented a capital of £263,000, as compared with £1,350,500 in the previous year; and the Registrar observes in this connection that in 1912 "money was scarce and company flotation consequently difficult." The increase in the number of bonds registered and cancelled is attributed largely to the operations of the Land Bank. This passage in the report will be read with interest: "Apart from the Land Bank bonds the rate of interest on first mortgage remains at an average of 8 per cent.; but as there appears to be a good deal of private money awaiting this form of investment I think it is likely that the rate of interest will fall." One also gathers from the report that there has been a good demand for good farms, and that the price of such is increasing. "There is now very little speculation in farms, the great majority of them being bought for *bona fide* occupation." On the other hand the market for stands has been somewhat neglected, though five-acres or larger plots in the neighbourhood of the towns find buyers.

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THE WEEK IN THE SHAREMARKET.

Better with Improving Tendency—General Advance in Gold Stocks—Tin and Diamonds Better.

The surrender of Montenegro and the acceptance by Austria and Italy of the Powers' intervention in regard to Albania have cleared the European horizon, temporarily at any rate, and smoothed the way for better markets. The consequent change was very pronounced in the tone and temper of business; and the week has seen a steady improvement in quotations in practically every department. Rand gold stocks have been led by Wit. Deeps, Van Ryn Deeps and most of the Central Mining stocks. Main Reef Wests seem to have touched their lowest on Saturday, and have firmed up a little since. The stock has certainly fallen on evil days, but cannot fail to recover some, at any rate, of its lost prestige one of these days. Brakpans have been somewhat weak without other reason than that given in the statement issued with the April output. Springs Mines have been firm on the success of the debenture issue, and the majority of other Rand stocks show improvement. Among tins, Rooibergs have been quietly firm without much business. The big profits for April may or may not be attributable to the fact that the manager is going on leave. Zaaiplaats have had a rise to 41s. and Swazis have been bought on the news of excellent profits being won. Nearly all diamond shares have gone better, and those under the Lewis & Marks ægis have naturally appreciated in view of the successful flotation of the S.A. Diamond Corporation. The gains for the week are reflected below:—

	* Friday, 2nd.	* Sat., 3rd.	* Mon., 5th.	* Tues., 6th.	Wed., 7th.	Thurs., 8th.
African Farms ..	16 4	16 6	16 3B	16 6	16 9	16 7B
Apex Mines	25 6B	26 6s	26 6s	26 3B	26 6B	26 0B
Aurora West Uniteds	—	—	—	—	—	9 0B
Bantjes Consolidated	20 3	20 3B	20 9	20 9	20 6s	20 0B
Benoni Consolidated	3 0B	3 0B	3 0B	3 0B	3 0B	3 3B
Blaauwbosch Diam...	—	100 0B	105 0B	106 3B	106 3B	107 6B
Brakpan Mines ..	77 6B	79 6B	78 0B	81 3B	83 0B	80 0B
Breyten Collieries ..	—	32 0s	32 0s	31 0B	31 0B	30 0B
Bushveld Tins ..	—	0 9B	—	0 9B	—	0 9B
Cassel Coals	—	13 0B	—	13 0B	—	—
City & Subs. (£4) ..	50 0	50 0B	50 0B	50 9	50 6	50 0B
City Deeps	69 0B	69 9B	69 3B	70 3	70 6	70 0
Cloverfield Mines ..	6 0B	6 1B	5 9B	6 5	6 3B	6 3B
Clydesdale Colls. ..	8 6B	—	8 6B	8 6B	—	—
Concrete Constr. ..	4 0B	4 0B	4 0B	4 0B	—	—
Cons. Langlaagtes ..	27 0B	27 0B	—	27 6B	27 3B	27 3B
Cons. Main Reefs ..	20 0B	20 3	20 0	20 0	19 0	19 0
Cons. Mine Select. ..	—	—	10 0B	11 6B	12 0B	—
Coronation Colls. —	—	—	—	15 0B	15 0B	15 0B
Coronation Freeholds	0 4B	0 4B	0 4B	0 4B	0 4B	0 4B
Coronation Synd. ..	—	—	3 6B	3 6B	—	3 6B
Crown Diamonds ..	8 0B	8 0B	8 0B	8 3B	8 0B	8 3B
Crown Mines ..	—	—	—	150 0B	150 0B	150 0B
East Rand Centrals ..	9 3B	9 0B	9 3B	9 6B	9 6B	9 6B
East Rand Coals (2/6)	1 8B	1 9	1 9	1 9B	—	1 9B
East Rand Deeps ..	2 5B	2 5B	—	3 0s	—	2 6
East Rand M. Est. ..	—	—	—	7 3B	—	—
East Rand Props. ..	55 0B	56 0B	—	58 0B	—	—
East Rand Debs. ..	£94s	£92B	£95s	£95s	£95s	£95s
Eastern Golds (1/-) ..	1 9B	1 9B	1 8	1 8B	1 8B	—
Frank Smith Diam.	11 6B	11 6B	11 6B	11 9	11 6B	11 9
Geduld Props. ..	23 0B	24 6s	23 0B	24 0B	24 0B	24 0B
Geldenhuis Deeps ..	—	—	—	34 0B	33 9B	33 9B
General Minings ..	18 0s	18 0s	18 6s	—	18 6s	—
Glencoe (Natal) Colls	7 0B	7 0B	7 0B	7 3B	7 0B	7 0B
Glynn's Lydenburgs	—	—	—	21 0s	21 0s	—
Goerz & Co.	—	—	—	—	—	13 0B
Government Areas ..	21 6	21 9B	21 6B	22 3	22 3	22 3B
Hex River Expls. ..	0 7B	0 8B	0 9B	0 9B	0 6B	0 6B
Jumpers	5 6s	—	—	—	5 6s	5 6s
Jupiters	10 9B	11 0B	10 9	11 6	11 0B	11 0B
Kaalfontein D. (2/6)	—	0 5s	0 5s	0 4s	—	—
Klerksdorp Props. ..	2 3	2 8B	2 7B	2 9	2 8B	2 8B
Knight Centrals ..	12 3B	12 3B	12 6	12 9B	12 6B	12 6
Lace Props.	3 6B	3 10s	3 8s	3 9B	3 9B	3 9B
Luipaardsvlei Est. ..	8 9B	—	—	—	—	8 6B
Lydenburg Gold Fms	2 8B	2 7B	2 7B	2 8B	2 8B	—
Main Reef Wests ..	12 9	12 0	11 6	12 6	12 3B	12 9
Main Reef West Debs.	—	£80B	—	£81B	£81B	£80B
Meyer & Charltons ..	—	—	—	108 9B	108 9B	—
Middlevlei Estates ..	1 1B	1 3B	1 3B	1 3B	1 3B	1 3B
Modder B's	79 6	—	—	81 0B	80 0*	81 0B
Modder Deeps ..	36 3B	36 6B	36 3B	37 0B	37 0	37 3B
French Rands ..	—	—	—	2 6s	—	—
Natal Navigation Col.	15 9s	—	—	16 0s	—	16 0s
New Boksburgs ..	2 0s	2 0s	—	—	1 0B	2 0s
New Eland Diam. ..	25 0B	—	25 0B	—	—	—
New Era Cons. (5/-) ..	7 6B	7 9B	7 9B	7 9B	7 9B	8 0

B Buyers. s Sellers. * 50 Shares.

	Friday, 2nd.	Sat., 3rd	Mon., 5th.	Tues., 6th.	Wed., 7th.	Thurs., 8th.
New Geduld Deeps ..	2 4B	2 3B	—	2 4B	2 4B	2 4B
New Heriots ..	—	—	—	—	—	—
New Kleinfontein ..	22 0B	23 0B	22 6B	23 3	24 3	24 0
New Modders ..	—	—	—	—	278 9	277 6
New Rietfonteins ..	—	6 3s	6 3s	—	—	—
New Unifieds ..	—	—	16 0s	14 6B	16 [illegible]	15 0B
Nigels	16 0B	—	—	—	—	—
O.F.S. & Trans. Dia.	1 10s	1 10s	1 11s	1 11s	1 8B	1 8B
Paardekraal Estates ..	0 6	—	—	—	—	—
Pickstone Golds ..	—	10 0B	—	40 0B	—	—
Pretoria Cement Co...	—	—	—	53 6B	52 6B	52 6B
Princess	8 0s	—	—	—	—	—
Rand Collieries ..	6 9B	7 0B	7 0B	7 3B	7 3B	7 3B
Rand Klips	1 9B	1 9B	1 9B	2 0	2 0	1 9B
Rand Nucleus ..	2 6B	2 7B	2 6B	2 7B	2 6B	2 7B
Randfontein Deeps ..	5 0s	—	6 0s	—	—	—
Randfontein Estates	28 6B	28 9B	28 6B	29 0B	29 3B	29 6B
Robinson Deeps ..	41 0B	42 0s	40 0B	41 3B	42 6s	41 0B
Rooiberg Minerals ..	36 0	36 0B	35 9B	36 0	36 3	36 3B
Ryan Nigels	3 3B	3 3B	—	4 0s	4 0s	3 9s
Salisbury	—	—	—	—	—	2 0s
Shebas..	5 0B	5 0B	5 0B	5 3	—	5 3s
Simmer Deeps ..	2 9B	3 6s	2 9B	3 6s	2 9B	2 9B
Solomon's Temple Tin	—	—	—	—	—	0 6s
S.A. Breweries ..	—	40 0B	—	—	—	40 0B
S.A. Lands	4 1B	4 1B	4 1	4 2B	4 2B	4 1B
S.A. Tin Mines ..	0 6s	—	—	—	—	—
Springs Mines ..	15 6B	15 3B	15 6	15 9B	15 6B	
Sub Nigels	12 0B	—	11 6B	12 0B	12 0B	12 3B
Swaziland Tins ..	—	12 0B	42 0B	45 0	45 0	45 0B
Trans. Coal Trusts ..	46 9B	47 3B	47 0B	49 0	49 0	49 0
Trans. Cons. Lands ..	27 6B	27 0B	—	—	—	—
Trans. G.M. Estates	—	52 0B	—	53 0B	—	—
Tudors	2 0s	—	2 0s	—	2 0s	2 0s
Van Dyks	—	—	—	—	—	2 6B
Van Ryn Deeps ..	28 6B	29 0B	29 0B	30 6	30 6	30 6
Village Deeps ..	41 6	42 6B	41 9B	42 0B	—	13 6B
Vogel. Cons. Deeps ..	1 9B	2 0s	2 3s	1 9B	2 3s	—
West Rand Estates ..	—	—	4 0B	4 0B	—	4 0B
Witbank Collieries	47 0B	—	47 0B	—	46 0B	—
Witwatersrands ..	—	—	—	68 0B	—	—
Wit Deeps	56 6B	57 6B	57 9	60 0	59 6B	61 0
Wit Townships ..	—	26 0B	26 0B	—	26 0B	26 0B
Wolhuters	16 0B	16 3	16 0B	15 9B	16 3	16 3
Zaaiplaats Tins ..	37 3B	38 3B	37 6B	39 6	40 0	40 6

B Buyers. s Sellers.

The Consolidated Oil Fields of South Africa, Limited.

To the Editor, *South African Mining Journal.*

Sir,—I notice a Mr. A. Lewis has waxed loquacious over the prospects of the above company, and I do not wish to rob that eminent expert of the credit of securing such a valuable asset to the Union by allowing the chance to go by and not explain that I am not the man referred to.—Yours, etc.,

ALFRED LEWIS.

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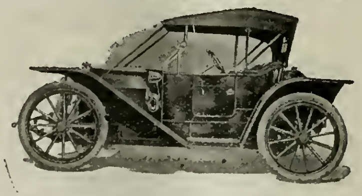

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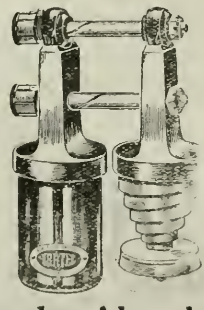

Shock Absorbers which are . . Different . . .

—different because the damping mediums are a volute spring and air. These volute springs are practically unbreakable ; absorb shocks and rebound completely and retain their tension almost indefinitely. Rebound is taken up by an air cushion. Fit Parsons' Shock Absorbers to your car and reduce upkeep expense by reducing wear and tear.

Parsons' Productions save time, save expense, save hard work, add to your comfort and greatly increase the efficiency of your car.

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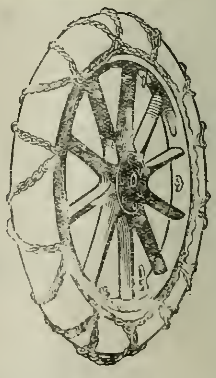

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Automobile Notes.

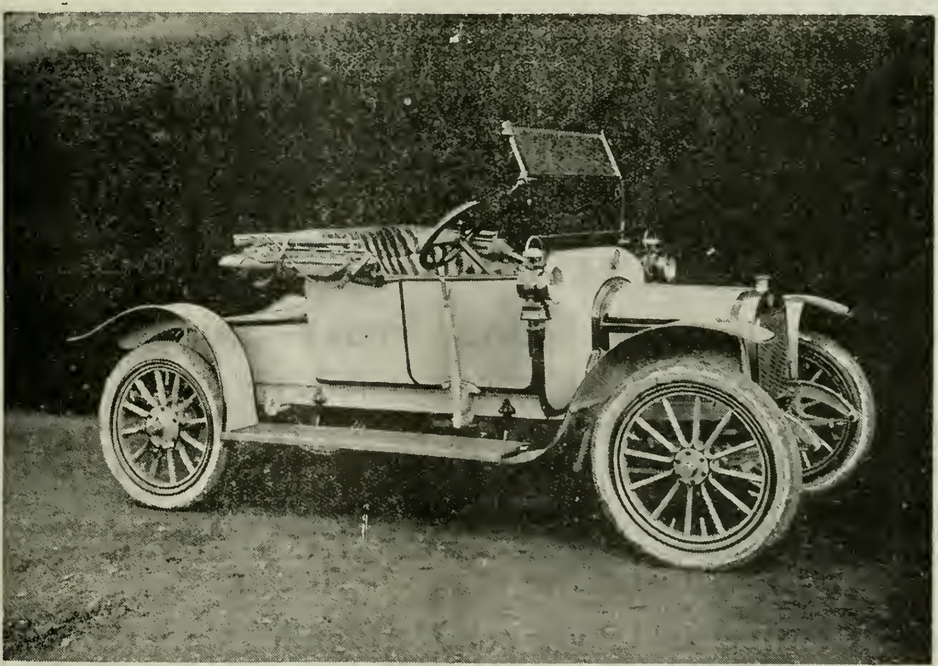
The vexed question of the fuel supply for internal combustion engines is, according to latest experiments, which seems taken for granted, one that holds a prospect of being easily settled by the production in large quantities of a fuel which is a cross between the benzole, petrol and paraffin series. The new fuel is produced by the del Monte low temperature distillation from a grade of coal known as cannel, which is at present something of a drug on the market, and can be purchased at about 5s. a ton. The spirit resembles petrol in appearance, but its odour is stronger and not quite so agreeable. It is primarily a coal tar spirit. Tests of its value have been carried out at Brooklands with a 12 h.p. Rover car. First of all this was run on petrol, at a speed of 30 m.p.h., till the supply ran out. Shell No. 1 gave a consumption of one gallon in 25·6 miles. The del Monte spirit was then used, and the car again run at 30 m.p.h. The new fuel gave a mileage of 28·8 to the gallon. On this spirit the engines started up with the greatest ease, although the carburetter adjustment had not been altered in the slightest. Moreover, the exhaust was practically odourless. Viewed from all points, the del Monte fuel may be said to give highly satisfactory results. It is clean to handle and has the same cleansing properties as petrol. The satisfactory results mentioned have been obtained with spirit produced in an experimental manner, and the investigations leave little doubt that better results might be secured and a cleaner spirit produced, when the process is brought to perfection and improved on in detail.

Of course, this is not the only fuel which is equal or superior to petrol as the motive power of internal combustion engines. Benzole is, in practically every respect, superior to petrol, but the difficulty is to secure supplies of sufficient magnitude for it to be universally adopted by motorists or affect petrol prices materially. It is obviously of great importance that one fuel should be universally adopted by motorists, and it is the commercial aspect of the production of del Monte spirit which augurs so well for its ultimate adoption as fuel for motors. Mr. Bertram Blount, F.I.C., has gone into the mattar thoroughly, and his figures show that, even though 1,200,000 gallons of the spirit were given away, a plant costing £120,000 could deal with 200,000 tons of coal costing £125,000, at a profit of some £30,000 per annum. Mr. Blount, pricing the spirit at 1s. per gallon, shows a possible total profit of £90,000 per annum.

* * * *

It must be understood that the spirit is a by-product, though the largest, for it is estimated that smokeless fuel to the value of about £170,000 would be left after the spirit, residual oils, pitch and sulphate of ammonia had been secured. The smokeless fuel alluded to has actually been burnt in an open grate, and gave off a splendid heat. No less a quantity than 21 gallons of petrol equivalent can be obtained from one ton of inferior coal.

10/14 AUSTIN TWO-SEATER.
AS POWERFUL AS MANY SO-CALLED 15 H.P. CARS.



Particulars from GILL'S GARAGE, Eloff Street, JOHANNESBURG.
P.O. Box 4659. 'Phone 1505.

It is impossible, of course, to describe the del Monte process in detail. The chief feature is that the distillation of coal is carried out at a temperature which is low compared with that used in gas-making. The latter is in several ways wasteful, and the production of gas is the primary object, with the result that the value of the by-products suffers. In the del Monte process the importance of the by-products is kept constantly in mind, and this explains its great commercial possibilities. It can be applied to various grades of coal, but in Mr. Blount's figures the material is priced at 12s. 6d. a ton, it being advantageous to use coal at this price in view of the value of the by-products derived from it. The process has three chief stages, the retorting of the coal, the extraction of the oils from the resulting gas, and the refining of the spirit from the crude oil. A feature of the process is that gas is kept constantly circulating through the heated coal either by suction or pumping.

* * * *

The Local Government Board has requested the National Physical Laboratory to make tests of motor car headlights, with a view to the framing of regulations for the suppression of unnecessary glare. The enforcement of regulations in this connection is likely to seriously inconvenience many motorists, and to cause considerable expense, for though there are lamps made which embody the anti-dazzling devices, by far the greater majority (estimated by some as high as 90 per cent.) are not so equipped.

World's Records

BY THE WONDERFUL "PEUGEOT" CAR.

It was only on the 15th of February of this year that a sensation was caused by a motor car travelling one hundred miles in one hour, the vehicle to gain that much-sought record being the 25 h.p. Talbot, owned by Lord Shrewsbury, and driven by Mr. Percy Lambert. The actual distance covered was 103 miles 1,470 yards. Yet that feat is already eclipsed, for at Brooklands, on Saturday, Jules Goux, the well-known Continental road-racer, driving Mr. H. Boisey's 30 h.p. Peugeot, crowded 106 miles 387 yards into the sixty minutes' running. The performance was accomplished in the course of an attempt on the six hours' record, which, however, was brought to a stop within an hour and a half owing to the burning out of the carburettor. The arrangement was for Goux and his compatriot Georges Boillot, to drive alternately in one hour spells, and the latter was therefore at the wheel at the finish. Four world's records were beaten during the ride, the figures being as follows: Fifty miles: New record, 28 min. 18.65 secs., a speed of 105.9 miles per hour. Previous best, 29 min. 2.5 secs., by Percy Lambert, on Lord Shrewsbury's 25 h.p. Talbot. Hundred miles: New record, 56 min. 29.93 secs., a speed of 106.4 miles per hour. Previous best, the Talbot's 57 min. 49.38 secs. One hour: New record, 106 miles 387 yards. Previous best, the Talbot's 103 miles 1,470 yards. One hundred and fifty miles: New record, 1 hr. 28 min. 35.67 secs., a speed of 101.59 miles per hour. Previous best, 1 hr. 31 min. 52.06 secs., by Victor Hemery on Mr. W. M. Letts's 60 h.p. Lorraine Dietrich. Messrs. Power & Greatrex, of 7 and 8, Bettleheim Buildings, Johannesburg, have, after considerable trouble and expense, been successful in securing the sole Transvaal agency for these exceptionally high-class cars, and the first consignment is due to arrive about the end of the present month. Intending purchasers and all interested in motor cars should make a point of inspecting a car that not only has proved itself the fastest in the world but is the acme of perfection and the last word in motor ingenuity from start to finish.

TIME AND MONEY SAVING DEVICES.

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No. 1. 3/- ea. Takes every Nut from $\frac{3}{16}$ to $\frac{1}{2}$ in.
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As even 1/16th inch of scale in a boiler will increase the coal consumption anything from 15 to 20 per cent., every good engineer wants to stop this waste.

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South African Mining Journal

The National Bank of South Africa, Ltd

PAYMENT OF DIVIDEND.

NOTICE IS HEREBY GIVEN that a Dividend of six per cent. per annum has been declared for the year ended 31st December, 1912, of which the Interim Dividend declared in August last absorbed six shillings per share, leaving six shillings per share available for the final distribution.

The Dividend will be payable to all Shareholders registered in the books of the Company at close of business on 5th April, 1913, and to holders of Coupon 29 attached to Share Warrants to Bearer.

Dividend Warrants will be posted to Registered Shareholders from London on 3rd May. Holders of Share Warrants to Bearer are informed that Coupons may be deposited at any of the Bank's Branches, and will, upon verification by Head Office, be paid on or after 5th May, 1913.

By Order of the Board of Directors,
C. P. MATHEWS,
Secretary.

Pretoria, 3rd May, 1913.

Jumpers-cum-Treasury.

The following cable has been despatched to the London Agency of this company:—" The following is the result of the joint working of the 'Jumpers' and Treasury mines during last month:—55 stamps, working 26 days, crushed 5,700 tons, yielding 1,508 ozs. fine gold from mill, 750 ozs. fine gold from tailings by cyanide, 275 ozs. fine gold from current slimes, and 402 ozs. fine gold from accumulated slimes; total from all sources, 2,935 ozs. fine gold. Value of output, £12,328; joint profit for the month, £1,003. Position of joint gold reserve at end of month, 473 ozs. fine gold."

ANSWERS TO CORRESPONDENTS.

" Hard Hit " (Lourenco Marques).—(1) No. (2) An official report appears elsewhere in this issue. (3) The price will be found in our share list.

" Investor."—Washing will recommence shortly, and good returns are expected.

INVESTORS' DIARY.

The following company meetings have been announced:—

May 10.—Roberts Victor.
May 16.—Wit. Deep; Marievale Nigel; Vogel Deep.
May 21.—Apex Mines; New Kleinfontein.
May 23.—Knight Central; Cloverfield Mines.
May 27.—Transvaal Coal Trust; Brakpan Mines; Springs Mines; New Era Consolidated.
May 28.—Tudor G.M.; Van Dyk Prop.: Princess Estate; Lancaster West; May Consolidated; Geduld Prop. Mines; Modderfontein Deep Levels.
May 29.—Roodepoort United; West Rand Consolidated; Meyer and Charlton; New Goch.
May 30.—Saeke Estates; Aurora West; Cinderella Consolidated; Nev Steyn Estate; Rand Collieries.
June 3.—Moderfontein B.; Robinson.
June 4.—Rose Deep; Village Deep.
June 5.—Durban Roodepoort Deep; City Deep.
June 6.—Bantjes Consolidated; Geldenhuis Deep; Crown Mines.
June 17.—Transvaal Consolidated Lands.
June 18.—Rand Mines.
June 27.—A. Goerz and Co.

Transvaal Consolidated Land and Exploration Co., Ltd.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Eighteenth Annual General Meeting of Shareholders will be held in the Board Room, The Corner House, Johannesburg, on TUESDAY, 17th JUNE, 1913, at 12 o'clock noon, for the following business:—

1. To receive the Reports of the Directors and Auditors, and to consider the Balance Sheet and Profit and Loss Account for the year ended 31st December, 1912.
2. To elect Directors in place of Messrs. H. C. Boyd, E. A. Wallers, W. H. Dawe, S. Marks, J. Jeppe, J. A. van der Byl, and B. T. Bourke, the preesnt Board, who retire in terms of the Company's Articles of Association, but who are eligible and offer themselves for re-election.
3. To elect Auditors in place of Messrs. Alex. Aiken and Carter, and Mr. H. J. Vining, who are eligible for re-election, and to fix their remuneration for the past Audit.
4. To transact General Business.

The Share Transfer Books will be closed from 17th to 24th June, 1913, both days inclusive.

Holders of Share Warrants to Bearer wishing to be present or represented at the Meeting must deposit their Share Warrants at the places and within the times following:—

(a) At the Head Office of the Company in Johannesburg, at least three days before the time appointed for the holding of the Meeting.

(b) At the London Office of the Company, No. 1, London Wall Buildings, London, E.C., at least 30 days before the date appointed for the holding of the Meeting.

(c) At the Compagnie Francaise de Banque et de Mines, 20, Rue Taitbout, Paris, at least 30 days before the date appointed for the holding of the Meeting.

By Order of the Board,
W. E. S. LEWIS, Secretary.

Head Office: The Corner House,
Johannesburg, Transvaal,
6th February, 1913.

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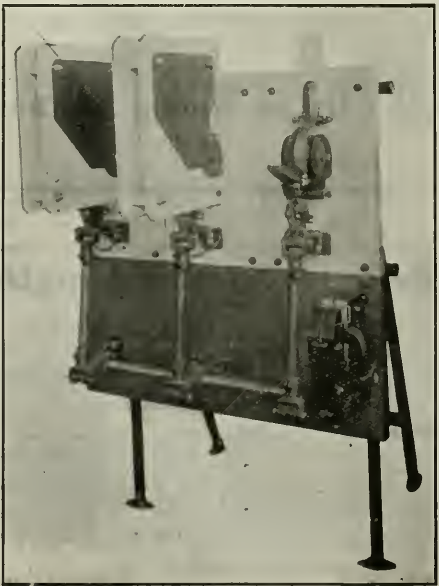

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No oil to catch fire, and to require renewal.
EVERYTHING IN PLAIN SIGHT.
Such an equipment, working here, with a 900 h.p. 2,000 volt. hoist motor has operated 375,000 times
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Mining Journal,

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Notes and News.

A Change of Management.

Mr. C. B. Brodigan, formerly manager of the Brakpan Mines, has been appointed to the management of the Roodepoort United Main Reef mine, of the General Mining and Finance Corporation group. We understand that Mr. Brodigan has already entered into his new office.

* * * *

New Filter Plants on the Rand.

The new Butters filter plant at the Randfontein Central G.M. Company, which has a nominal treatment capacity of 1,500 tons per day, started work last week. It is too early yet to say anything as to the results obtained, but we understand that the installation is giving every satisfaction. Within the next few weeks two other new Butters' plants will come into operation on the Rand—a 900 tons per day gravity plant at the Van Ryn Deep and a 500 tons per day pumping plant at Geduld.

* * * *

Nigel.

The annual meeting of the Nigel Gold Mining Company was held at Pietermaritzburg last week. The Chairman, Mr. L. Line, said the company was now out of debt, and the whole of the profits were available for dividends. They would pay 5 per cent. on June 30th, and hoped to pay 10 per cent. at the end of the year. The recent developments were highly satisfactory.

* * * *

Consolidated Langlaagte Debentures.

Details of the expected issue of debentures by the Consolidated Langlaagte were published this week. Six thousand debentures of £50 each, carrying interest at the rate of 5½ per cent. per annum and redeemable at par by twelve annual drawings are to be issued. The first redemption will take place on the 1st July, 1915, and thereafter on the 1st July of each succeeding year until the whole of the debentures are paid. The debentures shall in the first place be offered to the shareholders of the company registered as such on the 14th day of June, 1913, at the price of £49 for each £50 of debentures. The directors are to be authorised to enter into an agreement, whereby the Johannesburg Consolidated Investment Company, Limited, undertake, in consideration of the payment by the company of a commission of 3 per cent. upon the nominal value of the debenture issue, to take up and pay for, at the rate of £49 for each £50 of debentures, all debentures of the issue which are not applied for and allotted to shareholders.

* * * *

The Outlook for Diamonds.

The latest reports from the diamond markets of the world are most encouraging. The *Financial News*, which makes a special feature of its authoritative market report, has the following:—"The diamond market continues in its very satisfactory condition. The demand for all classes of goods remains as keen as ever, and the strike in Belgium, which has embraced some of the cutting factories in Antwerp, has had no influence on the buying orders of merchants in that city. The London Diamond Syndicate continue to sell as freely as ever. This week has seen the disposal of a Wesselton shipment, and, doubtless, next week their Kimberley production will go in the same easy manner. As we have constantly informed our readers in recent reports, diamond business has never been better. Stocks in the hands of dealers and cutters alike are greatly reduced, and the production that arrives weekly from South Africa is inadequate to meet the steady demand, which again this week shows signs of still further expansion. Such facts as these can have only one issue as far as the shareholders in the producing mines are concerned, and that issue is enhanced profits, and, consequently, increased dividends. The diamond section of the share market seems to be steadily recognising this, and higher prices are quoted for nearly all the leading shares."

African and European Investment Co., Ltd.

Prospecting work on Koppiesfontein, Bloemhof district, belonging to the African and European Investment Company, Limited, has resulted in discoveries of 30 carats of diamonds, worth £260. This farm will shortly be thrown open to diggers, who are applying in numbers. It adjoins Koppiesvlei, on which the value of diamonds discovered during March amounted to 1,113 carats, value £6,499. Koppiesfontein is one of six farms owned by this company in the district which are considered to be diamondiferous, and attention will be turned to the others.

* * * *

A New Tin Flotation.

The latest important company flotation in the Transvaal is styled the Olifants River Tin Mines, Ltd., in which Johannesburg, Pretoria and Pietersburg capital is interested, and which has been formed to take over the farms Mutue Fides and Tigerpad on the watershed of the Olifants River. The capital of this concern is £62,500, and the directors are Messrs. E. Brayshaw, B. W. Brayshaw, E. Rooth, T. H. Kleinenberg, A. R. Roberts and A. G. Worthinghton. The properties taken over are situated about 45 miles east of Pietpotgietersrust and have been reported on by Dr. G. S. Corstorphine. We learn that tin has been located at 62 different points and we gather from an inspection of specimens and from information supplied to us that a series of lenses, pipes and fissures carrying cassiterite have been exposed. Some of the specimens are of remarkably good appearance, and we understand that already a considerable tonnage of ore of satisfactory value has been mined. At present work is being concentrated at what are known as the Nos. 12 and 13 sections. A sum of £10,000 has been provided as working capital, and development is being pushed ahead under the superintendence of Mr. Bennet. It is noteworthy that the recent "T.C.L." report had the following reference to portions of these farms:—"Owing to the discovery recently made, the 'T.C.L.' Company decided to prospect the remainder of these farms, which are situated about 50 miles south-east of Potgietersrust and 6 miles from Olifants River. The geological formation is red granite belonging to the Bushveld Complex, and similar to that of the Groenfontein Tin Mine. Prospecting was started on the company's portion of Mutue Fides on the 1st September, 1912. During the period 1st September to 31st December a number of tin occurrences were opened in the form of impregnations and pipes in altered granite, at times associated with fissures. The quantity of ore extracted and dumped during the period is estimated at 74 tons of ore, containing 17 short tons of 70 per cent. concentrates. The prospect looks very promising, but it is too early as yet to make any statement as to the value of the farm as a future tin producer. This occurrence is on the company's portion of the farm adjoining the discovery right granted."

* * * *

New Vaal River Diamond Co.

This company hitherto has made up its accounts to June 30; the date is to be altered to December 31, and the first accounts to that date will be those to December 31, 1913. An interim report sets out the results of operations by lessors and licensees of the company's rights over an area of some 50,000 acres, thrown open for public digging in 1902. The company depends for its profits upon licenees, rents, and royalties. Its first dividend was announced in March this year, at the rate of 10 per cent. on the Ordinary shares. After 20 per cent. dividends are paid on the 198,858 Ordinary £1 shares, the two Founders' shares, also of £1 each, are entitled to receive 20 per cent. of any excess of profit beyond the sum required to meet the Ordinary dividend. The results shown by the whole field each half-year have recently been very good, as shown by the following contrast:—

	Carats secured.	Realised.	Per Carat.
June, 1911	8,945¼	£55,194	£6 3 5
December, 1911 ...	8,193¾	51,806	6 6 5
June, 1912	9,725	54,875	5 13 3
December, 1912 ..	16,660¾	124,770	7 10 3

Doornhoek Tin.

The position of the Doornhoek Tin Co.—formerly the S.A. Tin Co., Ltd.—though none too satisfactory, is improving. The year 1912 was a slightly better year than 1911: the mine produced 162·8 tons of concentrates against 142·5 in 1911, and the price of tin was higher; working costs were higher though, and increased stoping added to development redemption account. The company added to debit of profit and loss account £3,767 against £7,184 at the 31st of December, 1911. The following passage from the speech of the chairman, Mr. H. P. Rogers, at the annual meeting last week sums up the position:—

> "We have not found sufficiently rich ore to make tangible profits working on a small scale, nor have we been able to mine enough rock to sort up to a higher grade; it has been obvious for some time that further capital must be provided, and your directors have made every effort to obtain an adequate amount, without success; they have recently, however, obtained a subscription from shareholders of about £8,000, on terms with which you have been acquainted; a limited quantity of new plant has been ordered, the bulk of which is on the property, and approaching the running stage; the production of cassiterite should be increased about the end of this month, and development will be accelerated by the use of a new compressor some weeks later. It should be mentioned that the provision of this plant must be looked on as a preliminary step to an extended programme we hope to see carried out later; should the price of tin be maintained, and normal conditions of working prevail, our profits with the augmented plant should improve our position and enable us to raise more capital."

* * * *

Over 9,000 Rock Drills on the Rand.

For the first time in the history of the Province the Transvaal mines had over 6,000 rock drills in use last month. Of these 5,983 were employed on the Rand, the Heidelberg, Klerksdorp and Barberton districts accounting for 83 between them. These figures, sensational as they are, do not reflect the size of the market that exists on the Main Reef series for manufacturers of rock-drilling machinery. A note accompanying the official Government statistics states that the actual total number of rock drill machines "in commission" on the Witwatersrand was 9,018! The amount of manual labour displacement represented by this imposing array of mechanical devices for breaking ground is so prodigious one hesitates to say just how many natives would be required otherwise. In this connection one is tempted to quote from the speech of Mr. Elkan, delivered at the last annual meeting of the Chamber of Mines. "As far as the underground work is concerned," remarked the retiring President, "I would like to mention the truly remarkable increase that has taken place in the use of rock drills in the last few years. The earliest reliable figures at my disposal show that the gold mines used, in 1908, 2,425 such drills, and ever since then their number has been steadily increased, until it reached last year 5,530, or more than double the number that were in use in 1908. While formerly only large machines were used, the mines have now a number of small machines of various types at their disposal, but the last word with regard to drills has by no means been said yet. I understand that no drill is absolutely ideal and applicable to the different reef conditions obtaining in a mine, thus calling for various types having to be used in each mine. The endeavours of the manufacturers to supply us with what is really required deserve a word of praise, and it must be hoped that eventually they will succeed in turning out a drill meeting all our requirements."

* * * *

New Lisbon-Berlyn.

The future of the New Lisbon-Berlyn Company lies with its pyritic ore, and, to determine the value of this, Mr. Harold Sharpley—a gentleman who has made metallurgical problems a study and has had a wide Australian experience in dealing with them, has been asked to investigate the tonnage in sight, its approximate value and the question of treatment. His report is expected early in June, and upon it will depend the future policy of the board and the possible reorganisation of the company. So far as his experiments have gone, they have been most encouraging. The average value of many hundreds of samples, taken over 6,000 feet of reef, is 8 dwts., and Mr. Sharpley's final report is looked forward to with great interest and expectation. Hitherto, the New Lisbon-Berlyn Company has been working upon its oxidised ore, which has now become practically exhausted, as no new discoveries have been made. The Chairman, Captain Lawson, at the recent annual meeting, explained the position, but could only repeat what he said a year ago, that "in the making of the pyritic ore payable lies the future of the mine." The whole attention of the board is being concentrated on dealing with this problem, and it must be admitted that the directors have taken the most practical steps possible towards its solution. The drawback to the treatment of this class of ore has been the great cost of transporting coal to the spot, but now there is good reason to believe that, in the course of the present year, the railway will be open to Graskop, which is within a few miles of the mine. The next twelve months may decide the future of the New Lisbon-Berlyn Company.

* * * *

Roberts Victor Prospects.

The annual report of the Roberts Victor Co.—with which we recently dealt—was supplemented by the chairman, Mr. J. Emrys Evans, at the annual meeting last week.

"Washing operations will be resumed next Monday," Mr. Evans says, "and we may reasonably rely, on resuming, on our being able to keep the washing machines supplied to their capacity of about 20,000 loads per month. I see that my predecessor, Mr. Villiers, in his remarks at the last general meeting, made the statement that there should be about 300,000 loads of ground to wash with the proviso that this estimate was by no means final, and that there were expectations of further quantities of ground being available. Well, gentlemen, we have, since that statement was made, washed 195,532 loads from the fissure, and we are still going on washing. I am not going to hazard any opinion or make any forecast as to the future, but I will say that it will be a bold man who will to-day fix an end to the life of the Roberts Victor mine, for not only has the area of the fissure ground been doubled during the year, but we hope that successful results will attend our exploratory work in other directions within our mining area, and finally I would remind you that though underground work is temporarily suspended in favour of the open-cast workings, the last word as to the payability of the downward extensions of the mine and fissure has by no means been said."

* * * *

U.S.A. Diamond Taxation.

The draft of the new U.S.A. tariff proposes to put a tax of 10 per cent. on uncut diamonds and 15 per cent. on cut. At present the former are admitted free and the latter taxed 10 per cent. Of course, Congress may amend or alter these proposals, but, at worst, they are not very serious and can have little effect on the product, beyond increasing the value of existing stocks in the U.S.A.

* * * *

Coerz & Co., Ltd.

The full report of Messrs. Goerz & Co., Ltd., for 1912 is now available. The profit and loss account shows a loss for the year, after deducting all outgoings but before allowing for writings-off in respect of shareholdings, of £820 12s. 5d. Allowing for £38,568 14s. 5d. brought forward from 1911, the sum of £37,718 2s. remains to be carried forward to the credit of the profit and loss account. The holdings of shares and debentures in other companies had an aggregate value on December 31st last (based upon market prices, or upon the directors' valuations in those cases where no market price exists) of £1,095,135 17s. 7d., which is £210,502 4s. 4d. below the price (*i.e.*, cost or below cost) at which they stand in the company's books. This figure of £210,502 4s. 4d. compares with £118,699 16s. 6d. at December 31st, 1911. The reserve account remains at £160,000. The financial position on December 31st, 1912 showed an excess of cash assets, Government securities, and sundry debtors over liabilities of £238,607 10s. 8d. The report states that in spite of many adverse local conditions and in contrast to the continued market depression, the Rand has during the past year made material progress. This progress has been largely due to a satisfactory increase in the supply of native labour.

* * * *

Our Offices.

From the end of the current month the offices of this paper will be at 176-180, New Stock Exchange Buildings (second floor).

TOPICS OF THE WEEK.

MINE HEALTH QUESTIONS IN THE ASSEMBLY.

QUESTIONS concerning the health of mine employees almost monopolised the attention of the House of Assembly on Tuesday, and provoked a very discursive debate. When we find Mr. Madeley, Mr. Merriman, and Mr. Mentz, of Pietersburg, joining in the discussion, we expect some startling, if not over-exact, views on mining questions, and the report of Tuesday's debate does not disappoint us in that respect. Mr. Madeley, of Springs, appears to have prefaced a motion regarding the lump sum payment of phthisis compensation by a lengthy and somewhat incoherent attack on existing conditions on the mines. He holds that lump sum compensation is the only fair procedure, denounces the Compensation Board as under-staffed and dilatory in its methods; declares mine inspection is inadequate, and that no change has taken place in regard to the improvement of underground conditions. These sweeping asservations and violence of language carry, of course, their own refutation, and it is clear that Mr. Madeley's absence from the Rand has put him out of touch with recent progress on the mines. Mr. Mentz, from Pietersburg, appears to have taken his cue from Mr. Madeley and to have seized the opportunity for making mere political capital out of the question. Mr. Merriman, taking the *Worker* as his text and the Market Square eloquence of the Labour people as his model, set himself to lecture Government and industry with the easy assurance of the detached and distant critic. When he abandoned platitudes and indulged in detailed charges, his hearers were apparently surprised into silence at the audacity of his accusations. No sooner were they received on the Rand, however, than Mr. Schumacher immediately nailed the worst and most categorical charges to the counter, and Mr. Merriman stands convicted of supporting his arguments in Parliament with the veriest hearsay that is found to be wholly untrue when published. Mr. Merriman is proved to be wrong when he accuses the Crown Mines of over-working their natives and of being compelled by the Government to sink the new circular ventilation shaft in the western section of that property. Coming on top of such a tissue of inexactitudes, Mr. Chaplin's speech was a veritable model of moderation. He pointed out that the new Phthisis Act should have a little longer trial before being condemned; questioned Mr. Madeley's scepticism regarding the improvement in conditions, but agreed that if the critics were right the whole matter would have to be reconsidered. Mr. Chaplin very rightly refused to admit that solicitude for the employees on the Rand was a monopoly of any political party, and his speech, if perhaps a little too apologetic, was otherwise admirable in tone and temper. Like Mr. Chaplin, the Minister of Mines also spoke in a chastened spirit, and gently if firmly pointed out that conditions had improved, that the new regime had not yet had a fair trial, and that due consideration would be given to Mr. Madeley's suggestion in regard to lump sum phthisis compensation payments. More than that he could not promise. The outstanding feature of the debate is the irrelevance of most of the issues raised by the critics of the industry. When not actually attacking the Rand, some members, such as Mr. Merriman and the Labour people, never seem to be as happy as when they are advising and prescribing for it. No wearisome study of Rand problems is allowed to qualify or abbreviate the smug and grandmotherly omniscence of this patronising attitude, and the wonder is that the unfortunate industry is ever, even temporarily, relieved from these attentions at all. The net result of the day's talk in the Assembly on Tuesday is that the Minister of Mines has promised that he will consider an aspect of the phthisis compensation question which he never had any intention to forget, and that the Government has, for a wonder, refused to add another to the list of costly often useless, and always burdensome commissions of enquiry.

THE REPORTS OF THE DIAMOND-CUTTING COMMITTEE.

Ever since the beginning of the agitation in favour of a diamond-cutting industry this paper has made no secret of its doubts about the practicability of the proposal. We are all, of course, for the increase and expansion of South African industries, and no suggestion with that end in view ought lightly to be turned down without careful consideration. When it was announced, however, that the leading advocate of the industry, Senator Munnik, had been appointed chairman of the Select Committee on the question, no doubt remained regarding the bias of the consideration to be given. That conclusion is confirmed by the publication this week of the finding of the Committee. Four worthy Senators, including the chairman favour a ten per cent. export tax to encourage the industry. A minority of two demand more evidence, and a minority of one plumps dead against further taxation. Hitherto the public have had to be content with hearing the arguments in favour of the proposed industry, and to await the issue of the full report of the Select Committee for an adequate statement of the case against it. Fortunately, however, the chief valuator of De Beers, Mr. Arnold Brink, one of the leading authorities on diamonds in this country, has read a paper on the subject in Kimberley which may be regarded as authoritative and anticipating many of the arguments against interference in the existing conditions of things. The keynote of Mr. Brink's paper is that the idea of a diamond-cutting industry in this country is a "seductive proposition utterly impracticable." In a lengthy, logical, and convincing paper he proves his case up to the hilt. Space prevents us from quoting the paper as fully as we would wish, but we would suggest to the diamond industry that it be reprinted in pamphlet form and publicly circulated as a counter-blast to Mr. George Hay's free literature on the subject. Mr. Brink proves that adoption of the proposal means loss to the diamond mines, to the trade, to the Government and to the country. To attract the industry a thumping export tax would be needed, and the effect of such a tax would be demoralization of all the delicate springs of the trade and industry built up upon diamonds. There are, in Mr. Brink's opinion, two sets of people desiring the establishment of such an industry. The first class consists of a comparatively small number of adventurers, who, since they have failed in other branches of trade, regard the establishment of a new channel of industry as a means of possibly obtaining a more lucrative method of amassing wealth. The second class are actuated by higher motives. They contend that the spending power of the country would be enormously enhanced: secondly, that the diamond and gold mining are diminishing assets, and hence that the industrial and agricultural resources of the country should be carried out at the expense of these industries; thirdly, the establishment of such an industry would lead to the introduction of Europeans, a fact which would lessen the overwhelming preponderance of the native. These are lofty aims, says Mr. Brink, but a careful investigation must take place before we embark on so vast an enterprise. His concluding words summarize the position: "Whether the imposition of a tax, which must be sufficiently high to be effective, results in a restriction of production in order to maintain prices, or in a reduction of values corresponding to the percentage of duty imposed, it must in either case infallibly result in a dislocation of labour, in an unwarrantable interference with vested interests which no community would tolerate, and in a destruction of capital out of proportion to the benefits which it seeks to confer." The restriction of production, Mr. Brink shows, would mean the dismissal of a great part of the white and black labour employed on the mines. It would also spell greatly reduced profits and no dividend for the £25,000,000 of deferred shares in the two leading diamond-producing companies. That is what he means when he refers to the destruction of capital. Mr. Brink exhaustively analyses the efforts of the United States of America and Germany to introduce a diamond-cutting industry, and points the obvious moral for South Africa. He concludes with the following statement: "If an impartial statement of facts bearing on the most intricate question of the day succeeds in dispelling the mists of ignorance with regard to this question, and if thereby the danger of precipitating the country in a disaster of unexampled magnitude is averted, the writer will have the satisfaction of having rendered a service to the land of his birth. His only desire is to enable the general public to digest these facts and to afford food for reflection, in the confident hope that an impartial and unbiassed consideration of the whole question will lead to a sane and commonsense conclusion." The fact of the whole matter is that no Government composed of thinking men could seriously contemplate interference of so cataclysmic and catastrophic a nature as would be meant by the adoption of the glib and airy proposals of the four senatorial advocates of a diamond-cutting industry in South Africa.

INDUSTRIAL HYGIENE.

Since his return from Panama, Mr. Samuel Evans has favoured several of the papers, including ourselves, with his views on that wonderful engineering feat and on the signal success of Colonel Gorgas in combatting the ravages of disease among the workers. At present we are only concerned with the latter, to which a timely and opportune interest has been lent by the disclosures regarding the death rate of tropical boys from pneumonia on the Rand. In the interview with him published in the "Star" this week, Mr. Evans refers to the many points of similarity existing between the Isthmus of Panama and the Rand, not the least important of which is the incidence of pneumonia among the black workers. If this scourge were conquered on the Rand the death-rate from disease would no longer be serious. During the time the French were carrying on active operations on the Canal, notably between 1882 and 1889, the death-rate from pneumonia among the West Indian Negroes employed was throughout greater than it has ever been on the Rand or on the mines of Southern Rhodesia. The striking fall that has taken place under the American regime is all the more remarkable because none of the sanitary measures adopted were specifically directed against pneumonia. When Colonel Gorgas undertook the herculean task of rendering the Canal zone healthy he concentrated his attention at first on yellow fever, malaria and plague, and—at the outset in the face of severe criticism by orthodox sanitarians—he carried out a policy which resulted in almost immediate and extraordinary success. The main features of this policy were the creation of conditions which rendered it difficult, if not impossible, for insects to spread disease. Following these lines Mr. Evans believes that health conditions among mine workers generally would rapidly improve were (1) the Municipalities along the reef to put their own houses in order by handling their garbage quickly and without carting it long distances; getting rid of the breeding places of flies, and replacing the pail system by a water-borne service. (2) The Union Government to encourage the mines to attend to their own sanitation where they can do so efficiently, and not place them wholly at the mercy of the Municipalities in this matter. "I should like, however, to make it quite clear," adds Mr. Evans, "that I am not finding fault with the municipal medical officers of health on the Rand. It is the Municipal Health Committees and, to a lesser extent, the Finance Committees, that are the parties largely responsible for the present state of affairs." The importance of these observations and conclusions requires no emphasis from us. They are not entirely new on the Rand, owing to the fact that certain of the groups—notably the Corner House—have always been alive to the dangers of fly-borne disease. It is not enough for the Municipalities to reply, as the Town Clerk of Johannesburg has done, in a rambling *apologia*, that the mines are seeking a scapegoat for the high mortality rate among their tropical "boys," that one individual mine has sought to drive a bargain with the Municipality regarding the cost of installing a water-borne system, and that Municipal sanitary "boys" can boast a low death-rate from pneumonia. Where these arguments are not based on wrong premises they are wholly beside the point, and it is clear that Mr. Evans has raised the whole question to a plane of certainty that demands more immediate and most thorough consideration than it has received in the *obiter dicta* "dashed off" by our omniscent Town Clerk.

VAN RYN DEEP: PROGRESS OF CONSTRUCTION.

Entire Plant Practically Completed—Excellent Underground Developments.

CONSTRUCTIONAL work at the Van Ryn Deep has now reached a very advanced stage, and, despite serious delays in the arrival of certain important items of machinery—largely due to industrial pressure in England—the equipment is nearly completed. It was hoped to have the new plant running next month, but on account of the fact that arrival of some portions of the equipment is still being awaited, the date of commencement of operations cannot be predicted with any degree of certainty. The parts that have yet to arrive are not in themselves of very much importance, but they are links in the chain of construction and as such are of vital moment. Perhaps the management will be enabled to give the plant a trial run towards the end of next month, or it may not be possible to start up until July. In any case the reduction and treatment plants are now nearly completed, and in the course of the next few months the company will begin to add a very substantial quota to the Rand's gold output. All the principal portions of the installation are now completed. As will be seen from the accompanying photograph, the mill building is finished; so, too, is the tube mill plant. In the cyanide works the tanks are all ready, and work on the Butters' slimes plant is being pushed ahead. The crusher station is not advanced so much as might be desired, and the company is awaiting arrival of an ore bin for that portion of the equipment.

VAN RYN DEEP: HOW THE REDUCTION PLANT LOOKS TO-DAY.

CONSTRUCTION IN THE MARCH QUARTER.

The position in regard to construction at the end of the March quarter was: The erection of the mill building had been nearly completed, and the king posts, mortar boxes and the line shafting placed in position. The tube mill house was practically finished, and the tubes, amalgam tables, coarse and fine sands pumps erected. The collecting tanks, sand treatment tanks and slimes tanks had been erected. The Butters' filter plant and extractor house were well advanced. The compressor house for two 50-drill compressors had been completed, and the foundations of the compressors put in. The crushers and the waste rock bins had been erected, and a start made with the erection of the steel building. The extension to the compound and a block of eight married quarters had been completed, and the extension to the native hospital, two staff houses and electric hoist building at the west shaft was nearing completion. The main switchboard at the transformer house was well advanced, and the cables to the different points of supply were being laid. As stated in the earlier portion of this article, the position has advanced considerably since the end of March, and it may be said that at the time of writing the equipment is almost completed throughout.

Underground Work.

As to the position [illegible] develop-ment continues to d[illegible] and it can be stated with certainty that the proposition will inaugurate its entry [illegible] under most encouraging and happy circumstances. The tonnage blocked out in the March quarter had the [illegible] value of 10·3 dwts. per ton, and the ore reserves [illegible] about a million and a half tons. The official announcement as to the work carried out underground in the March quarter [illegible]. The west incline shaft was sunk 139 feet to a total depth of 2,927 feet, and then stopped for the [illegible]. The engine chambers for the electric hoists at the east and west inclines have been cut, and the foundations of the hoist at the west incline completed. The development of the eastern and central sections of the mine has opened up ground of very satisfactory value, and encouraging values have also been obtained in the lower portion of the western section. The total footage driven, risen and sunk, exclusive of shaft sinking, amounted to 5,239 feet, of which 3,092 feet were sampled, giving an average of 21·1 dwts. over 27 inches. Of the footage sampled 2,571 feet were payable and of an average value of 26·5 dwts. over 25 inches, and 521 feet unpayable at 2·3 dwts. over 35 inches. The payable ore reserves were increased by 208,311 stoping tons of a value of 10·3 dwts., bringing the total payable reserves to 1,486,334 tons of an average value of 7·5 dwts. Assuming 15 per cent. sorting, this would bring the milling tonnage to 1,263,392 tons of an assay value of 8·9 dwts. The unpayable reserves at the 31st March amounted to 574,576 tons having an assay value of 2·9 dwts. A start was made during the quarter with the opening up of stope faces.

Palmer's North Rand.

The following are the April returns of the Palmer's North Rand G.M. Co.:—Running time for mill, 21 days; ore crushed, 1,177 tons; fine ozs. gold recovered, 329·49 ozs.; working costs per ton, 18s. 2¾d. There was a stoppage of four days for repairs to engine and mill.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of April:—Central Mines: Tons crushed, 12,700, yielding 8,188·160 fine ounces. Elandsdrift Mine: Tons crushed, 630, yielding 611·687 fine ounces. Vaalhoek Mine: Tons crushed, 1,430, yielding 523·367 fine ounces. Estimated value of month's output, £39,427; estimated profit for the month, £23,194.

CONSOLIDATED LANGLAAGTE REDUCTION PLANT.

The New Plant Described—Satisfactory Metallurgical Results—March Extraction, 96.6 per cent.

On Saturday afternoon last the South African Institution of Engineers visited the Consolidated Langlaagte Mines, by invitation of the management, and inspected the new plant. This equipment has on several occasions been described in the columns of this journal, but since the installation represents the last word in Rand milling and cyaniding practice a recapitulation of the essential features of the plant should prove of interest. Before proceeding with such a description, however, attention may be directed to the metallurgical results which have been of a highly efficient and satisfactory nature.

The following is a summary of the results obtained during the three months ended 31st March, 1913 :—

The mill screening varied from .375 in. to .5 in. aperture, and the actual falling weight of the stamps averaged 1,758 lbs. The stamp duties were as follows :—

	Tons per stamp per 24 hours.
January	18.230
February	19.545
March	20.135

The grading of the final pulp to the cyanide works was :—

	+60	+90	+200	−200
	%	%	%	%
January	.69	14.33	23.58	61.40
February	.27	10.04	22.83	66.86
March	.12	10.33	20.03	69.52

By means of the double cone classification, 39.5 per cent. of sand and 60.5 per cent. of slime were obtained. The actual percentages of gold recovered were as follows :—

	January.	February.	March.
	%	%	%
Recovery by amalgamation	71.982	70.474	72.880
Recovery from sand	12.118	12.667	12.221
Recovery from slime	12.423	13.607	11.502
	96.523	96.748	96.603
	Dwt.	Dwt.	Dwt.
Value of residue per ton milled	.221	.219	.231

The reduction plant is designed for a capacity of 45,000 tons of ore milled per month of 26 days, no milling being permitted on Sundays. The surface equipment is not entirely new, as the slimes plant and sand treatment tanks, together with the extractor house, formed part of the old reduction works which were in operation for some years prior to the starting up of the new mill. When embarking on the new scheme of construction, therefore, the general arrangement of the plant had to be adapted to permit of the new portions fitting in with those already existing. The East Shaft is of five compartments, and is provided with a 105 ft. steel headgear. It is served by a Siemens-Fraser and Chalmers Ward-Leonard hoist, and a Robey 16½in. by 33in. geared steam hoist. The compressor plant is situated at this shaft, and consists of two 50-drill Riedler steam-driven compressors, and one 50-drill Siemens-Pokorny and Wittekind electrically-driven compressor. Steam is supplied to the units requiring it by a range of Babcock and Wilcox boilers. Change houses are provided for white men and tropical natives, both houses being steam heated. The equipment of the West Shaft is similar to that at the East Shaft, but is without the compressors and the native change house. The Ward-Leonard hoists are provided with safety devices by which all current is cut off and emergency brakes applied in the event of any one of the following contingencies :—Failure of current; over load; over speed of converter set; failure of exciter; failure of excitation of winding motor; and failure of compressed air. There is also an emergency switch on driver's platform. The maximum speed of winding is 2,500 feet per minute, and the load four tons of rock. It is not possible to unclutch the brake of either drum until the brake controlling such drum is fully applied, nor can the brake controlling an unclutched drum be released until such drum has been clutched in again. The generators have an open slot commutator, and the winding motors have compensated field windings, commutating poles and staggered brushes. The ore is delivered without classification into bins at the headgear, whence it is conveyed in 36-cubic-foot trucks to the receiving bin by means of electric haulage.

The receiving bin, which is of steel and concrete construction, delivers the ore on to three 30in. belts running at a speed of 150 feet per minute. Each belt discharges over a short grizzley into a swing and washing trommel. The undersize from the grizzleys and trommels discharges on to a 30in. belt, which delivers on to the main 30in conveyor belt leading into the mill. The washings from the trommels and the sorting belts are conveyed by launder to the coarse sand pumps. The oversize from each of the trommels is delivered to a 36in. sorting belt, running at a speed of 40 feet per minute. Waste rock and tube mill pebbles are thrown into separate bins under the sorting belts. Each sorting belt discharges into a 39⅜in. by 15¾in. Amme, Giesecke, and Konegen jaw crusher, the product from which is carried by a 24in. belt to the mill conveyor belt. The dust produced in breaking the ore is exhausted by a fan, and after spraying with water is delivered to the launder carrying the trommel undersize. The sorted waste is transported from the bins by trucks to the dump. The ore is elevated at an angle of 18 degrees by a 30in. belt conveyor, running at a speed of 300 feet per minute, and is distributed over the mill bin by means of a shuttle belt. The tube mill pebbles are conveyed in a similar manner from the crusher station to the shuttle belt, and thence to the pebble storage bin at the west end of the mill building. The mill bin has a capacity of 3,000 tons of ore. The mill, which is of the "single side" design, is equipped with 100 Californian stamps, each of 1,900 lbs. falling weight when new, making 98 drops of 8½in. per minute. The mortar boxes are of the open-fronted type, and the ore is fed by means of Comet feeders. Ten stamps are driven by a 50 h.p. motor operating through a counter shaft to two cam shafts, each of which carries five stamps.

There are ten tube mills, 16ft. 6in. long by 6ft. diameter. Each tube is driven at the outlet end through spur gearing and belt by a 100 h.p. motor. The battery pulp from each ten stamps gravitates to a primary cone classifier at the head of each tube mill, this classifier being 6ft. diameter by 9ft. deep. One secondary cone of smaller size is provided for each two primary cones. The underflow from the primary cones passes to the tube mills, and the overflow passes into the secondary cones. The overflow from the latter is led direct to the fine sand pumps, whilst the underflow is led to the coarse sand pumps. The tube mill pebbles are brought from the pebble bin by trucks, and are deposited into a hopper placed at the inlet end of each tube mill. In the plate house there are 40 stationary amalgamating tables, each 7ft. by 5ft. Each tube mill discharges through a launder on to a set of four tables. Opening out of the plate house is the clean-up room, which is equipped with two retorts, two bullion furnaces, three amalgam barrels, batea, and amalgam press. A strong-room is also provided. The pulp from the plates is conveyed by a launder to a reinforced concrete sump, having a capacity equal to the product of ten minutes' crushing in the mill. The pulp is elevated by 10in. Robeson-Davidson pumps with 12in. suction, and is distributed to the tube mill primary cones by means of launders. The overflow from the secondary cones passes, as mentioned above, direct to the fine sand pumps, which are also 10in. Robeson-Davidson. These pumps are provided with suction hoppers, having overflow launders leading back to the coarse pump sump. The fine sand pumps elevate the final pulp to the sand classifiers. The principle of double classification is adopted, the classifiers being cones 8ft. diameter by 10ft. deep. The primary cones, six in number, are fitted with rings to catch candle grease and wood fibre from the mine, and are provided with Dowsett regulators. The underflow, suitably diluted, passes to three secondary cones, which are fitted with water regulators giving a wet underflow. The underflow from the secondary cones passes to three sand collecting tanks, which are each 55ft. diameter by 10ft. deep, and are provided with peripheral launders. Butters' distributors are used. The overflow from the primary classifiers is led to four sand return cones, each 7ft. 6in. diameter by 5ft. 10½in. deep. The overflow from these cones, together with the overflow from the secondary classifiers and the sand collectors, goes direct to the slimes collectors, and the underflow is returned to the fine sand pumps for reclassification.

The sand is discharged from the collectors by bottom discharge doors on to belt conveyors, which carry it to a Blaisdell distributor placed over the treatment tanks. There are twelve treatment tanks, each 40ft. by 9ft. 6in., and the treated sand is discharged into trucks and conveyed to the dump by mechanical haulage. The extractor house contains sixteen compounded extractor boxes and is provided with an acid treatment plant and smelting room. The latter contains calcining and reverberatory furnaces, ball mill, and strong room. The decantation slimes plant consists of the following tanks :—Two collecting tanks 70ft. diameter by 12ft. with 7ft. 6½in. cone; five collecting tanks 50ft. diameter by 12ft. with 6ft. cone; two treatment tanks 70ft. diameter by 12ft. with 7ft. 6½in. cone; ten treatment tanks 50ft. diameter by 12ft. with 6ft. cone; one intermediate transfer tank 50ft. diameter by 12ft. with 6ft. cone. The overflow water from the collectors is led to a return water sump, from which it is pumped to the mill supply tanks by 10in. Rees-Roturbo pumps. Power for operating the whole of the reduction plant is supplied by the Victoria Falls and Transvaal Power Company. The power is delivered by the Falls Company at the main seven-cubicle transformer house, and is supplied at 2,100 and 525 volts to the switch house which forms a portion of the main transformer house. Switchgear is provided governing all the feeder cables outgoing to mill, tube mill, crusher station, hoists, etc., arrangements being provided for disconnecting each cable at either end. The switchgear in the main transformer house is divided up into groups of five switches, *i.e.*, one station switch (800 amperes per phase) and four distributing switches (each 200 amperes per phase). The station switch controls the four distribution switches. The switches are provided with two overload release coils, which are governed by instantaneous relays. The main switch house also contains a Peebles Le Cour 200 k.w. converter set to supply current for surface traction, whilst a Sandycroft 250 h.p. 2,000 volt cascade motor driving a Siemens 550 volt d.c. compound generator acts as a standby. All feeders emanating from the main transformer house consist of three core paper insulated lead covered and twin steel strip armoured cable laid directly in the ground.

Distributing houses are provided at the following points:—Mill crusher station, East Shaft, and West Shaft. The feeders terminate at these houses, and each motor is then connected by a separate cable from the bus bars provided in the distributing houses. The small cables from distributing houses to motors terminate in sheet iron switch cubicles, and removable insulated links are provided in the distributing houses for each motor. No motor switch cubicle may be unlocked until the three links controlling the supply to such cubicle and situated in the distributing house have been removed and brought to the cubicle. The lead sheathing and strip armouring of all cables form a continuous electrical conductor from end to end, which, together with the motor switchboard, framing, and motor control cubicles, are substantially earthed at many points. The following motors are at 2,000 volts between phases:—Mill crusher station, tube mills, hoists, compressors and mine pumps. The motors for mine pumping are at 2,000 volts, and are provided with a drying-out circuit; thus, before switching in a motor, it can, if necessary, be dried out in a very short time by short circuiting the rotor and coupling the motor on to a 190 volt circuit [illegible] between the phases of the lighting transformers.

FURTHER EAST RAND FACTS AND FIGURES.

Remarkable Growth of Production East of Boksburg—Nearly a Quarter of a Million a Month in Working Expenses—Valuable Data for Investors and Merchants.

COMPLETION of the new equipments at the Van Ryn Deep and Geduld Proprietary Mines means that an additional measure of importance will be assumed by the Further East Rand gold field within the next few weeks. The capacity of the new 80 stamps plus 8 tube mills equipment of the former mine is 40,000 tons per month, and a detailed description of the progress of construction work will be found elsewhere in this issue. The additional 10 stamps and 4 tube mills at Geduld will mean that that company will be crushing 24,000 tons per month as against an average of about 14,000 tons per month last year. There will thus be an additional 50,000 tons per month crushed by the mines lying to the east of Boksburg at an early date and a corresponding (or perhaps, in view of the excellent values disclosed in the Van Ryn Deep development a more than corresponding increase) in the gold output. Similarly the amounts of money paid out each month in working expenditure and the profits will be increased. There can be no doubt that investors, mining machinery manufacturers, merchants, and the public generally have yet to adequately realise the importance of this Further East Rand gold field and what it means to the industry at large.

PROGRESS OF FOUR YEARS.

A few facts and figures may help to emphasize the points we wish to make. Four years ago there were three mines crushing on the Further East Rand. They employed 480 stamps and 7 tube mills between them and the details of crushing (for March, 1909) were as under:—

	Stps.	Tube Mills.	Tons Crushed.	Output.	Working Costs.	Profit.
New Kleinfontein	200	—	36.145	£56.278	£30,674	£25,008
New Modderfontein	120	3	29,800	47,817	30,268	17,131
Van Ryn	160	4	31,800	47,396	23,665	23.801
	480	7	97,745	£151,491	£84,607	£65,940

Let us look at the position as it stands to-day. In March last six mines were producing and the figures of ore milled, gold produced, profit earned, and expenditure on working account stand as under:—

	Stps.	Tube Mills.	Tons Milled.	Output.	Working Costs.	Profit.
Brakpan Mines	160	8	55,274	£81,153	£50,340	£30,116
Geduld Proprietary	50	2	14,300	17,509	15,724	1,714
Modderfontein B.	80	5	35,250	66,192	27,493	37,995
New Kleinfontein	200	4	51,700	73,205	47,500	25,002
New Modderfontein	180	7	52,000	102,192	51,324	48,986
Van Ryn	135	6	39,580	50,009	30,253	25,127
	805	32	248.104	£390,260	£222,654	£158.940

Taking these figures on an annual instead of a monthly basis, the following important figures are arrived at:—

	1909.	1913.
Ore milled (tons)	1,172,940	2,977,248
Gold produced	£1,817,892	£4,683,120
Working expenses	£1,015,284	£2,671,848
Profit	£791,280	£2,027,280

The growths in production, in profit earning and in the amounts of money distributed as working expenses are remarkable, but that they will show further large advance within the next twelve months is common knowledge. By the end of this year the output of the Further East Rand field should be at the rate of nearly six millions per annum. And it will certainly not stop at that stupendous sum.

LIMITATIONS IMPOSSIBLE TO STATE.

Brakpan is installing more stamps and tube mills. Increases to milling plants at the New Modderfontein and Modder B. are under consideration. The Modder Deep Levels is fast attaining to the productive stage, and at the Government Gold Mining Areas on Modderfontein shaft sinking and development operations are being pushed ahead. The Apex-Benoni section should become productive at an early date, and later the Cloverfield, Welgedacht, Geygerle, Daggafontein, Van Dyk and Rand Collieries areas, together with the two other Government lease mines, will increase the production to a much larger sum. Indeed, the limitations of the industry on the Further East Rand are incapable of any accurate delineation to-day, and it may at the least be assumed that the rise of this gold field will counterbalance the decline in production brought about by the expiration of the life of some of the most prolific properties of the Central Rand.

HOW THE COUNTRY BENEFITS.

The point of working expenditure is perhaps the most vital from a local standpoint. And quite apart from the large amounts paid out each month on account of operating expenditure it should be observed that last year the undermentioned active companies on the Further East section paid out £1,060,593 for and on account of development, shaft sinking, machinery and buildings, etc. The amounts expended on capital account by the concerns in question were as follows:—Apex Mines, £72,686; Brakpan Mines, £48,728; Geduld, £74,840; Modder Government Areas, £252,718; Modder B., £22,797; Modder Deep Levels, £89,193; New Kleinfontein, £77,728; New Modderfontein, £110,171; Springs Mines, £122,675; Van Ryn Deep, £189,057.

Messina Copper.

The March operations of the Messina (Transvaal) Development Company's property were as follows: The mill ran 24.2 days and treated 1,936 tons of ore, producing 327.65 tons of concentrates, having an average assay value of 43.5 per cent., and 214 tons of middlings, of an average value of 17 per cent. 442 feet of development was accomplished. The new hauling shaft (No. 5), is now down 334 feet, and is timbered to below the 3rd level. At the 6th level in the winze going down for the No. 5 shaft, some good ore is showing. At the 7th level Bonanza lode in the footwall portion, a crosscut north was put in, and at about 15 feet from drive, some good bornite was cut into, which continued for about 11 feet. This 11 feet of reef will average about 12 per cent. over 5 feet, and is so far the best lode yet got in the footwall section at this level. Good progress is being made with the erection of the new mill building.

CAPITAL EXPENDITURE IN 1912.

Amounts Paid for Machinery and Materials—Last Year's Additions to Equipment.

IV.—" GENERAL MINING " AND GOERZ SUBSIDIARIES.

We hereunder continue our examination of expenditures incurred by Witwatersrand mines last year on capital accounts. In previous issues we dealt with expenditures incurred under this head by nine mines of the Central Mining and Investment Corporation group, with mines which are under the control of the Johannesburg Consolidated Investment Co., with the Brakpan Mines, with certain subsidiaries of the Consolidated Gold Fields of South Africa, S. Neumann and Company, of the Anglo-French Exploration Company, and the East Rand Proprietary Mines. We this week deal with subsidiaries of the General Mining and Finance Corporation and A. Goerz and Company.

Cinderella Consolidated.

In the Cinderella section of this property a Stine patent fan, with the necessary driving equipment, was put in at the 3,000 feet level, thus effecting a considerable improvement in the ventilation of the mine. A 3-ton Ward Leonard electrical winder, to take the place of the No. 2 steam hoist, was erected and brought into use at the latter end of the year and is working satisfactorily. Certain alterations were made to the headgear to enable cages to be used on the 5-ton winder whilst the shift is being sent down or brought up from the mine, the transfer of men up and down the shaft being greatly accelerated thereby. A travelling crane was installed in the portion of the engine room occupied by the Nos. 1 and 2 steam hoists preparatory to the conversion of the hoists into compressors. A mechanical haulage equipment was installed in the main tramming way at the 3,620 feet level crosscut. An electric pump and the necessary driving gear was installed at the 3rd level of the incline shaft. In the Central section an electric winch, to serve the pump compartment, was erected at the central shaft. Two Pearn pumps were installed at the 1,000 feet horizon and the erection of two similar pumps at the 2,000 fee horizon was nearing completion at the end of the year. Expenditure on capital account for the year was:—Mine equipment and development: Permanent works, £66,048 14s. 4d.; machinery and plant, less proceeds of sales, £27,759 18s. 9d.; buildings, £5,204 16s.; surface improvements, £50 9s. 6d.; expenditure on development unredeemed, £55,668 9s. 1d.; total, £154,732 7s. 8d.

West Rand Consolidated.

At this property European change houses were erected at No. 1 and Rand shafts in accordance with the requirements of the new Mines and Works Regulations. A native change house for tropical natives was erected at the east shaft. The diameter of the tailings wheel was increased by five feet and all the mill and tube mill launders were regraded. The slimes plant was extended by the addition of another six tanks with the necessary pumps and equipment. Two new slimes dams were made and a new return water pump installed. Extensions were made to the compound kitchen and cooking equipment to meet the requirements of the increased number of natives. Alterations were made to the mill bins and conveyor belts to facilitate the handling of the tube mill pebbles, and a mono-rail installation was laid down to transport the pebbles to the tube mill house. The small head gear, hauling engine and boiler at the old Rand shaft were taken down and re-erected at the Rand "A" shaft. A drill sharpening and blacksmith shop was erected at the Rand "A" shaft. Expenditure on capital account for the year was:—Mine development and equipment: Permanent works, £18,292 16s. 11d.; machinery and plant (less proceeds of sales), £13,816 16s. 6d.; buildings, £2,110 15s. 1d.; less expenditure on development unredeemed, £2,109 16s. 10s.; total, £32,410 11s. 8d.

Meyer and Charlton.

Here the expenditure on capital account was £11,086, made up of permanent works, £5,373; machinery and plant, £5,713.

New Goch.

At this mine £2,790 were expended on machinery and plant and £180 on buildings.

Aurora West.

Expenditure during 1912 at this mine was:—Permanent works, £4,344 1s.; machinery and plant, £6,795 0s. 6d.; buildings, £2,672 10s. 4d.; mine development, £1,579 6s. 3d.; total, £15,390 18s. 1d.

Roodepoort United.

At the Roodepoort United Main Reef there were expended during 1912 £28,949 on permanent works, £1,520 machinery and plant (less proceeds of sales), and £236 on buildings, making a total of £30,706. This with expenditure on development unredeemed brings the total up to £35,068. During the year the steam hoist at Kimberley East shaft was replaced by an electric winder and a change house erected. Drinking water service was installed underground at all shafts. A waste rock skip elevator was constructed for Kimberley main shaft and is working very satisfactorily. The workshops and mine stores were removed from the United section and re-erected in close proximity to Kimberley main shaft to expedite work and delivery of stores.

Princess Estate.

Here ten stamps were removed from the old Princess mill and re-erected at the Central mill, bringing the total number at the latter plant up to 60. These additional stamps came into operation in May. Two additional boilers and smoke stack were erected at the Central steaming plant. Various other details of construction were completed in the early months of the year. The expenditure on capital account was as follows:—Construction, £10,895 4s. 6d.; boilers, £1,055 6s. 5d.; mill extension, £131 4s. 2d.; shafts, dewatering, call bells and underground water service, £4,728 8s. 11d.; mine development, £33,665 6s. 2d., less redeemed £33,302 11s.—£362 15s. 2d.; total, £17,172 19s. 2d.

Lancaster West.

At the Lancaster West there were expended on shafts £676, and machinery and plant and buildings £2,805.

Modder Deep Levels.

Expenditure on capital account during the year amounted to £89,193 1s. 5d. as follows:—Shaft No. 1, £23,062 14s. 1d.; shaft No. 2, £34,211 17s. 9d.; connecting crosscuts, stations, pump chambers and sumps, main incline shaft, and development, £21,351 9s. 10d.; machinery and plant and buildings, £9,716 7s. 8d.; sundries, £850 12s. 1d.; total, £89,193 1s. 5d. During the year there were erected ten single rooms for the accommodation of the additional white employees required for development, an addition to the workshops, an assay office and a permanent change house for all white employees. The temporary white change house was converted into a sample crusher house. Machinery and plant: A Hoppe pump having a capacity of 380,000 gallons per 24 hours, forming a unit in the permanent pumping plant, was installed at the 1,400 foot connecting crosscut. A 6-inch pump column and 8-inch air column were installed in No. 1 shaft between the surface and 3,000 foot level, and all necessary cables for pumping, lighting, telephones and signal bells were completed in both shafts.

GEDULD PROPRIETARY

The amounts spent on capital account during the year were:—Shaft No. 2, £6,800 1s. 10d.; buildings, £9,742 15s 7d.; machinery and plant, £8,198 8s. 10d.; battery plant, £784 3s.; cyanide plant, £4,226 1s. 5d.; slimes plant, £4,820 4s. 7d.; sorting and crushing plant, £191 3s.; tube mill plant, £1,924 0s. 9d.; live stock and vehicles, £68 12s.; furniture, £26; mine development, £75,439 15s. 7d., less redeemed, £37,971—£37,468 15s. 7d.; investments—net expenditure, £609 4s.; total, £74,859 10s. 7d.; deduct re electric lighting and power plant—credit for revenue received, £19, net total £74,840 10s. 7d. An additional ten stamps and three tube mills with the necessary pumping plant, housing, etc., were in course of erection. At the sand plant, Caldecott classifiers and tables for collection of sand were being installed with all pumps and gear pertaining to the same. The capacity of the slime plant was being increased by the erection of a Butters' filter plant and four Brown tanks. The extractor house was enlarged and additional boxes installed. The main station and arrangements at No. 2 shaft were in course of alteration to permit of the cheaper and quicker handling of a larger tonnage of ore and waste. A mechanical haulage was installed in the main incline from this shaft which transports all ore between No. 2 level and the station and which can be extended as occasion demands.

CONDITIONS ON THE MINES.

Mr. R. W. Schumacher on Rand Housing Schemes—The Miners' Earnings.

THE interesting and valuable discussion at the Unionist Party Club on the insecurity of tenure on the mines was brought to a conclusion by Mr. R. W. Schumacher last Saturday evening. Mr. Schumacher agreed with a great deal that had been said of the importance of stopping these changes at the mines, which were so frequent and often so unnecessary. His own opinion was, that the importance of handling men was almost supreme, and that a manager with only a fair knowledge of mining, but who was good at handling men, might do better work than one who was expert in mining, but bad at handling men. He thought that some of the figures given regarding changes did not give a correct picture, notably when they dealt with percentages. One speaker said that 13 per cent. of the underground men changed monthly. They could not reckon that if there were 13 per cent. in a month there would be 78 per cent. in six months, because many of the changes were confined to a comparatively small number of men. On one mine 75 per cent. were practically stationary, and the other 25 per cent. might be moving every month, but that did not tell him that 50 per cent. changed in two months or 100 per cent. in four months. The question had been raised of an official over the manager's head. There was an appeal to the Board of Directors, and he received a number of such appeals. As a general rule, he dealt with them in conjunction with the manager; also, as a general rule, he thought that if a manager was not fit to deal with them alone he should leave his position. As to the City Deep housing scheme, if a man wished to give up one of the cottages he might do so, for he (Mr. Schumacher) did not want to rush a man to take up a house he had not asked for, and rather than rush men he would give a year's free option at a fair rental. If, at the end of a year, they did not like it, they could give it up. His ideas on land coincided with those of many present. He had not taken up the question of housing in a party or political sense, but as an employer of labour. He agreed that all employers of labour were not ideal employers, but he did not agree with a speaker who said that all the employees were ideal employees. He maintained that they had a number of the best workmen that could be found in the world. He held, too, that a workingman should have an opportunity of getting his plot of land cheaply. Evidence was given some time ago before a certain commission that there were 50,000 stands unsold in the townships around Johannesburg, and it was asked, "What need is there for these housing schemes?" He knew he would not be making himself popular when he said that the reason of the existence of these vacant stands was, that the people who owned them were asking exorbitant prices for them. At any rate, he was determined to give the men employed at his mines an opportunity of getting their land for practically nothing, and whatever criticisms might be passed, nothing would make him deviate a hair's-breadth from that policy. But the housing question was not everything, and it was not going to settle everything by itself; but it was one of these things that played a very large part. He had been asked how many married and unmarried miners there were. The figures showed almost exactly half of each.

MONTHLY EARNINGS.

He would like to express his opinion that if a man earned a large cheque he generally deserved it. He did not, in his last week's speech, mean to imply that the men should not be earning as much as they had been, and in this regard he might quote certain figures which referred to the earnings per month of contractors underground. In August, 1912, there were earning under £100 for 27 shifts, 41 men between £90 and £100, 41 between £80 and £90, 48 between £70 and £80, 87 between £60 and £70, 157 between £50 and £60, 267 between £40 and £50, 378 between £30 and £40, 578 between £20 and £30, 696 between £10 and £20, 291 up to £10. As regarded cutting the miners' contract price, he agreed that it was wrong; but a complete change of system could not be done in a day or a month. Contracts for longer periods of time should be introduced underground where possible. As regarded the general question of notice, the 24 hours' notice should be lengthened. His own idea was, that a man who had been a miner could still be turned into a farmer. There might be unsuitable cases, and before the Phthisis Commission he argued that £8 compensation per month was not sufficient, and that the Government should take in hand a land scheme. The suggestion was not sympathetically received. In conclusion, Mr. Schumacher said that he meant to continue with the housing scheme, and denied that the mining houses were completely out of touch with the men.

Namaqua Copper.

As foreshadowed in last year's report, considerable economy has resulted from the working of the new power plant of the Namaqua Copper Company, which has proved very satisfactory. A new concentration plant will soon be in operation for the treatment of low-grade ores. The smelting furnaces have worked regularly throughout the year with satisfactory results, and the precipitation tanks have proved a useful addition to the plant. The output of copper in 1912 was practically the same as in 1911. The usual amount of exploratory and development work has been done, whereby the reserves of ore at the end of the year were nearly the same as at the end of the previous twelve months. The dividend of 37½ per cent. absorbs £70,748, leaving £7,515 to be carried forward.

ANOTHER CIRCULAR VENTILATION SHAFT FOR THE RAND.

City Deep Company's Decision—Reef Expected at 2,300 Feet in Two Years' Time—Total Cost, £70,000—Mr. Schumacher on Ventilation and Safety in Sinking.

In our last issue we referred to the new circular shaft which is to be sunk in the extreme western section of the Crown Mines for the purpose of improving the ventilation of that property. Since that article was written we have received an official communication from the Board of the City Deep, Ltd., stating the following has been cabled to London for publication:—" The Board of Directors has decided to proceed immediately to sink a circular shaft for ventilation purposes in the centre of the property and three hundred feet south of its northern boundary. The work will take nearly two years to complete. It will ensure an adequate system of ventilation for the whole mine throughout its life and greatly improve underground working conditions. The depth will be approximately 2,300 feet and the entire cost £70,000, which will be considerably more than covered by the proceeds realised from the proposed sale of fifteen claims to the City and Suburban Gold Mining and Estate Co., Ltd."

An 18ft. Shaft.

The new City Deep shaft, like the projected pit for the Crown Mines and the shaft that has been sunk at the New Modderfontein, will be 18 feet in diameter. The depth to the reef in the City Deep is estimated at 300 feet more than in the case of the Crown Mines, and it is interesting to note that it will be located between the two existing rectangular pits and will be situated at no greater distance than 300 feet south of the northern boundary of the property. As the distance from the northern to the southern boundary of the City Deep property is close on 7,000 feet, it can scarcely be truthfully stated that the shaft will be in the centre of the property, although it will be located about half-way between the eastern and western boundaries of the mine. The object of this shaft, as at the Crown Mines, is to improve underground working conditions and that " it will ensure an adequate system of ventilation for the whole mine throughout its life " is a matter for all-round congratulation. The fact that the controlling House—the Central Mining and Investment Corporation—and the respective Boards of the City Deep and Crown Mines have decided to spend the large sums of money required in the sinking of these shafts with the object of improving ventilation is convincing testimony to the sincerity of the Corner House people in their desire to see more healthful underground conditions obtain.

Costs of Sinking.

The total cost of the City Deep shaft, it will be noted, is given as £70,000. Taking the depth as 2,300 feet, this will mean the expenditure of over £30 for each foot sunk, but we presume this estimate includes cost of equipment at the new shaft and in actual practice it is probable the sinking costs pure and simple will approximate to those incurred at the New Modderfontein. It may be recalled that at this latter property the circular shaft was stopped at a depth of 2,258 feet from surface, that the cost of sinking averaged £14 9s. 5d. per foot and of bricking £7 12s. 2d. per foot, or a total of £22 1s. 7d. per foot, whilst the cost of surface equipment, exclusive of quarters, amounted to £30,077. On the basis of these figures the actual sinking charges at the City Deep should, in the aggregate, amount to about £51,000. Before passing on from the question of cost to a consideration of other aspects of the City Deep shaft, we cannot refrain from making the point that the sinking costs at the New Modder have evoked surprisingly little discussion. A few months ago the relative advantages and disadvantages of circular and rectangular pits were vigorously debated locally. At the time that much interesting discussion was appearing in our columns we remarked that the experience of the New Modder Company should afford valuable data bearing on the debate, and we are surprised that in technical circles the subject has not been more vigorously discussed. We have heard it remarked that criticism might be directed against the New Modderfontein Company's figures were the costs published in analysed form, *i.e.*, charges segregated according to native labour, to explosives, etc., In any case the New Modderfontein management has made out a very strong case for the circular shaft on the ground of economy, and as round shafts are admittedly more advantageous from the point of view of ventilation than are rectangular pits it would appear that very serious objections will have to be urged against the circular type to justify future decisions to sink rectangular shafts.

A Start Made.

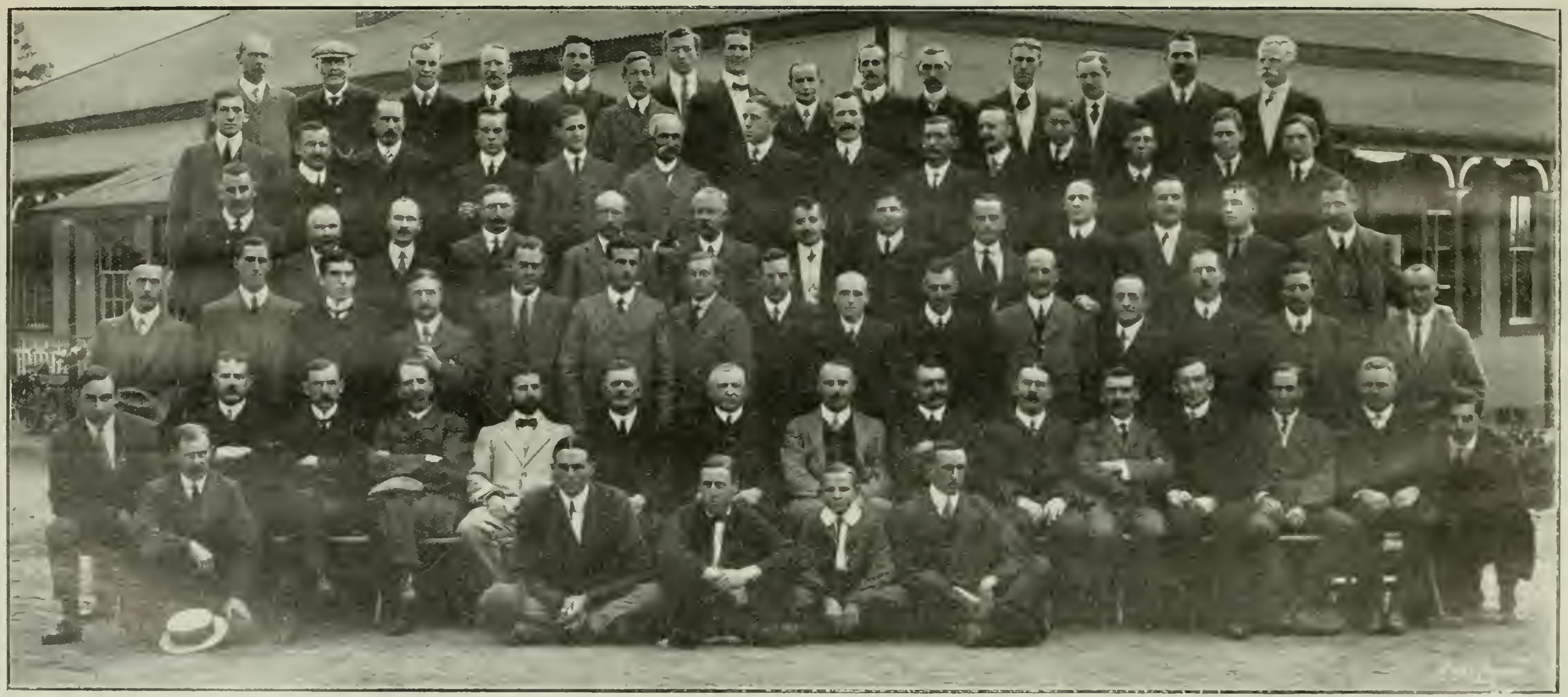
The ceremony of turning the first sod of the City Deep shaft was performed on Monday afternoon by Mr. R. N. Kotze, Government Mining Engineer, in the presence of a large gathering, which included Mr. R. W. Schumacher, who was accompanied by Mr. Max Francke; Mr. M. Tillard, mine manager, and Mrs. Tillard; Mr. B. Madew, consulting engineer; Mr. R. C. Atkinson, of the mechanical engineering staff, Corner House; Mr. L. Pryce, resident engineer; Mr. E. G. Izod, acting consulting electrical and mechanical engineer; Mr. J. H. Quirk, acting mine secretary, and Mrs. Quirk; Mrs. Foxcroft, Mrs. Jolly, Mrs. Hammond, Mrs. Soleby, and the mine captains and a large number of employees. Mr. Schumacher, after having welcomed Mr. Kotze, said that the shaft, which was situated 300 feet to the south of the northern boundary, would be 18 feet in diameter, and that it was estimated that it would strike the reef at a vertical depth of 2,300 feet. The sole object of sinking the shaft was for ventilation. The company wanted to improve once and for all the underground conditions of the mine. They had considered with great care the various courses by means of which that could be done, and they finally came to the conclusion that to carry out Mr. Madew's strong recommendation that a shaft should be sunk was the best course, and perhaps the only right course. There would be simultaneously another circular shaft sunk of similar dimensions at the Crown Mines. While there would be friendly rivalry between the two properties during the sinking of those shafts, and while he was sure that both schemes would be carried out at top speed, he was confident that the master sinkers in each case would see that the rapidity of their work would in no way interfere with safety, because life came before speed. Mr. Ratcliffe, the master sinker, had told him that he had already in his life sunk shafts to a total depth of something like 15 miles; therefore, they could entrust the work to Mr. Ratcliffe's care without any doubt or anxiety. Blasting would take place by electricity, as was the case at their present eastern shaft, which was also being sunk to meet the reef.

New Kleinfontein.

The following are the particulars of results of operations on the New Kleinfontein Company's property for April:—Stamps, 200; days run, 29·391; tube mills, 4; tons milled, 51,800; gold recovered (fine ounces), 18,201·072; net value, £76,433; profit, £29,944; working costs (excluding development), 16s. 7·118d.; development to working costs, 1s. 4·272d.; total working costs, 17s. 11·390d.; capital expenditure, £3,838. The profit is abnormally high through the grade for the month being above the average.

The Natal Spruit Syndicate has reported the loss of £600 worth of slimes gold to the Germiston police. The latter are investigating the case, but no particulars are at present available.

THE MANAGER AND STAFF OF THE ROSE DEEP, LTD.



Top row.—B. J. Hastings, Cyanide Foreman; P. F. Trotter, Caretaker; F. Gilbert, Shift Boss; A. B. Scandrett, Compound Clerk; G. F. Goulding, Hospital Superintendent; J. P. Johns, Chief Sampler; N. L. Henwood, Assistant Surveyor; N. H. Osselton, Shift Boss; J. Ralph, Shift Boss; G. A. Doig, Assistant Sampler; G. Weir, Shift Boss; H. Zeeman, Assistant Sampler; R. W. Whitworth, Shift Boss; J. H. Jordaan, Transport Overseer; G. Black, Shift Boss.

Fourth row.—W. Maxwell, Assistant Secretary; T. M. Fairweather, Assistant Storekeeper; J. Wearne, Shift Boss; E. M. Skea, Assistant Assayer; J. Milligan, Assistant Assayer; H. Roberts, T. H. Johns, Shift Boss; J. McKnight, Shift Boss; W. Wilkinson, Shift Boss; H. Unwin, Shift Boss; T. Atkinson, Assistant Timekeeper; A. Lancaster, Assistant Timekeeper; A. Lawrence, Stores Issuer; C. Hulber, Assistant Timekeeper.

Third row.—P. Bannerman, Mill Foreman; J. Davidson, Foreman Smith; H. Cameron, Assistant Timekeeper; A. W. Baillie, Crusher Foreman; J. D. Bell, Assistant Timekeeper; J. McMean, Foreman Boilermaker; W. S. Hunter, Shift Boss; A. Hirschberg, Assistant Timekeeper; H. F. Brand, Shift Boss; F. L. Roux, Shift Boss; R. P. Channer, Shift Boss; T. Jones, Assistant Assayer; D. McKay, Foreman Fitter.

Second row.—C. E. Fleming, Battery Manager; H. O. Yates, Assistant Smelter; M. Ramsay, Assistant Surveyor; S. Chavasse, Sectional Electrical Engineer; A. van Velden, Assistant Surveyor; S. H. Lewis, Chief Surveyor; H. S. H. Donald, Assistant Surveyor; J. Scott, Foreman Fitter; A. D. Brown, Correspondence; L. G. Stuart, Smelter; A. S. Bertram, Battery Manager; W. J. Foster, Storekeeper; R. D. Graham, Assistant Storekeeper; W. B. Dodds, Cyanide Foreman; A. H. Gott, Assistant Compound Manager.

First row.—S. R. Wellbeloved, Assistant Timekeeper; A. R. Duncan, Chief Native Timekeeper; H. G. Lewis, Chief Timekeeper; T. L. Inman, Chief Assayer; S. H. Steels, Reduction Officer; T. Holmes, Chief Engineer; C. Newton Launder, Manager; A. J. Walton, General Manager; J. Fairweather, Mine Secretary; J. Eastwick, Mine Captain; A. Ramsay, Mine Captain; E. J. Rowe, Mine Captain; W. O. C. Ross, Mine Captain; F. Crosbie, Compound Manager; E. A. Wellbeloved, Assistant Timekeeper.

On ground.—A. Menzies, Native Interpreter; J. H. C. Attwell, Native Interpreter; J. Ashford, Compound Clerk; A. Jordaan, Ticket Sorter; H. J. Bristow, Assistant Compound Manager.

MINE SAMPLING AND ORE VALUATION, WITH SPECIAL REFERENCE TO THE WITWATERSRAND AREA.—IV.

[By Arthur S. Lejeune.]

Averaging of Assays, etc.—*Continued.*

Estimation of Gold Recovery.—It is possible from the sampling results to estimate the gold recovery of a mine each month. In the following example let it be assumed that the tonnages have already been calculated. The example shows the calculation as it would be done on a mine in which two reefs, viz., Main Reef and South Reef, are mined:—

The All Day G.M. Co., Ltd.
Gold Recovery for February, 1908.

Reef.	Reef Tons.	Stope Tons.	Waste Tons.	Ore in Bins at beginning of month.
Main Reef ..	18760	39525	20765	964
South Meef ..	1450	2750	1300	67
Totals ..	20210	42275	22065	1031

Tons sorted as obtained from reduction works = 8,394, i.e., percentage waste sorted = $\frac{8,394}{22,065} \times 100 = 38{\cdot}04\%$.

In the above the figures in column headed "Waste Tons" added to those in the "Reef Tons" column must give the figure under "Stope Tons," as a stope comprises only reef and waste.

Calculation of Mill Tons.—(a) Main Reef: Reef tons, 18,760; stope tons, 39,525; waste tons, 20,765. Tons waste sorted = 38·04% of 20,765 = 7,900, *i.e.*, percentage sorted of stope tons = $\frac{7,900}{39,525} \times 100 = 19{\cdot}99\%$, *i.e.*, mill tons = $\frac{39,525 \times 80{\cdot}01}{100}$ (100% – 19·99% = 80·01%) = 31,624 tons, + ore in bins at beginning of month, 964 tons. Milled from Main Reef, total 32,588 tons.

(b) South Reef: Reef tons, 1,450; stope tons, 2,750; waste tons, 1,300. Tons waste sorted = 38·04% of 1,300 = 495 tons. Percentage of stope tons sorted $\frac{495 \times 100}{2,750} = 17{\cdot}96\%$. This leaves 100 – 17·96 = 82·04% of stope tons to be milled. Tons milled from South Reef, $\frac{2,750 \times 82{\cdot}04}{100}$ = 2,256 tons, + ore in bins at beginning of month, 67 tons. Total tons milled from South Reef, 2,323 tons; total tons milled from Main Reef, 32,588 tons; total tons milled from both reefs, 34,911 tons. Average assay of rock milled as derived from assay office returns = 10·100 dwts. per ton. Tons from development = 6,000 tons @ 6.00 dwts. Tons actually milled as obtained from reduction works = 40,850. Actually milled, 40,911 tons; value, 10·100 dwts.; gold contents, 413,201 dwts. Development, 6,000 tons; value, 6·00 dwts.; gold contents, 36,000 dwts. Stopes, 34,911 tons; value, 10·80 dwts.; gold contents, 377,201 dwts. In this case the total tons actually milled and the tons from development are multiplied by the respective values to give the gold contents. The difference between the tons milled and tons from development gives a check on the stope tons and dividing this into the difference between the total gold contents and those of the development, the average value of the stope tons is arrived at. Now suppose the average value of the stopes, calculated on a milling basis, from the sampling results, was 10·72, then the gold called for by the sampling results is 34,911 tons × 10·72 = 371,246, plus 6,000 tons × 6·00 = 36,000; total 410,246 dwts. Assuming for purposes of illustration that 98·02% of the total gold in the rock was recovered, these figures become:—Gold actually recovered, 413,201 × 98·02% = 405,020 dwts. Gold called for by sampling results = 410,246 × 98·02% = 402,133 dwts. Difference = 2,887 dwts. and $\frac{2,887}{405,020} \times 100 = 0{\cdot}71\%$. It is almost impossible, however, to come so near to the correct gold output. The figure as derived from sampling should, nevertheless, never be more in error than an amount equal to 5% of the actual recovery.

Calculation of Tonnages.—In the Witwatersrand area it can be assumed that 12 cubic feet of reef *in situ* weigh one ton. Now a square fathom is 36 square feet, and dividing 12 cubic feet by 36 square feet we get $\frac{1}{3}$ foot, or 4 inches. It follows then that a square fathom of ground having a thickness of 4 inches weighs exactly one ton. Now, assuming one stope has a stoping width of 60 inches, it is evident that every square fathom of ground in this stope must weigh $\frac{60}{4} = 15$ tons. It further follows that in any stope, if the stoping width be divided by 4, the figure obtained represents the tons per fathom of the ground stoped. Further, if the tons per fathom so obtained be multiplied by the fathomage stoped a figure is arrived at giving the total tons stoped in this stope. For example: In a certain mine the following represent the fathomages stoped and the widths in inches:—

Stope No.	Fathoms.	Stope Width.
1	20·3	60″
2	18·2	50″
3	52·1	42″
4	19·6	41″
5	30·5	81″
6	28·4	78″
7	46·2	56″
8	51·5	62″

Then the tonnages from the various places are calculated as shown in the following table:—

Stope No.	Fathoms.	Stope width.	Tons per fathom.	Tons.
1	20·3	60″	15·00	305
2	18·2	50″	12·50	228
3	52·1	42″	10·50	547
4	19·6	41″	10·25	201
5	30·5	81″	20·25	618
6	28·4	78″	19·50	554
7	46·2	56″	14·00	647
8	51·5	62″	15·50	798
Totals and Averages	266·8	58·44″	14·61	3898

In the above table the tonnages are obtained by multiplying "tons per fathom" by "fathoms" and the average tons per fathom by dividing the total tons by the total fathoms. From this figure the average stoping width is derived by multiplying by 4.

(*To be continued.*)

East Rand Proprietary Mines.

The following are the results of last month's operations at the East Rand Proprietary Mines:—820 stamps milled 162,000 tons; 58,565 ounces fine gold recovered, including 1,221 ounces of fine gold recovered from the accumulated slimes; £95,204 profit for the month, including £3,212 profit from the accumulated slime. The profits for the first four months of the year are: January, £95,698; February, £89,514; March, £95,010; April, £95,204.

THE APRIL OUTPUT IN DETAIL.

Many Good Features of a Short Month—Over 10,000 Stamps at Work.

The April output was declared last Saturday as follows:—

Total output	784,974 ozs.
Value	£3,334,358
Decrease	5,578 ozs.
Value	£23,692
Rand output	755,858 ozs.
Value	£3,210,682
Decrease	4,466 ozs.
Value	£18,970
Outside districts	29,116 ozs.
Value	£123,676
Decrease	1,112 ozs.
Value	£4,722
Total stamps	10,004
Increase	59
Rand	9,530
Increase	55
Outside districts	516
Increase	4
Tubes	285

The Witwatersrand output of 755,858 ozs., value £3,210,682, is only short of the March return by 4,466 ozs., value £18,970, whereas the average daily yield is over £107,000, and there is improvement in the month's work to the extent of the difference between the daily average called for by the extra day and the actual decrease. The outside districts with a return of 29,116 ozs., value £123,676, show a decrease on March, which in itself was a decrease on February, of 1,112 ozs., value £4,722. It will be noticed that returns are made for the first time by the Quest Mine—the old Buffelsdoorn—and Ceylon Lydenburg. Both these mines have been winning gold for some time, but their yields have been included in the total for miscellaneous producers. This alteration, it will be seen, is responsible for most of the shortage under the heading of "miscellaneous." The native labour returns, according to the Native Labour Association figures, show that the influx is beginning to be restricted, as is common at this time of year, and that for the first time for seven months the arrivals were fewer than the departures to the extent of 1,680. The number is not great but the turn of the tide has come a month earlier than in either of the two previous years. The average daily profit of £35,931 is £117 per diem better than the previous best recorded for February, and must be admitted to be highly satisfactory.

LABOUR.

There is a decrease for April of 1,680, according to the Witwatersrand Native Labour Association figures, compared with March, on the total employed on gold, coal and diamond mines. There is a decrease on gold mines of 2,309, and an increase on coal mines of 44, while diamond mines increased their complement by 585. The figures for the past three months of the numbers employed by members of the Witwatersrand Native Labour Association at the last day of each month read:—

	February.	March.	April.
Gold mines	207,662	207,733	205,424
Coal mines	8,877	9,009	9,053
Diamond mines	13,918	15,041	15,626
Totals	230,457	231,783	230,103

THE STAMP POSITION

The stamp position for the whole of the Transvaal shows an increase of 59, compared with March. The Rand returns an increase of 55, and outside districts an increase of 4. The number of tube mills in operation on the Rand were 277, and also eight in outside districts. The details of the changes are:—Rand: Increases: Cons Main Reef, 10; Jupiter, 10; Randfontein Central, 15; Simmer Deep, 20; Van Ryn, 5; total, 60. Decrease: Cinderella, 5. Net increase, 55. Outside districts: Increases: New contributors—Ceylon Lydenburg, 5; Quest, 35; total, 40. Decreases: Miscellaneous, 36. Net increase, 4. Total increase, 59.

THE FIRST DOZEN COMPANIES.

The following are the details of production of the twelve leading companies:

	Stamps.	Tube Mills	Tons Crushed.	Value.
Crown Mines	660	25	196,600	£297,073
Randfontein Central	865	29	230,820	275,843
East Rand Proprietary	820	25	162,000	253,959
Ferreira Deep	250	6	55,110	120,249
Robinson	250	6	59,500	103,186
New Modderfontein	180	7	52,200	100,879
Rose Deep	300	7	68,810	99,949
Geldenhuis Deep	300	7	60,300	90,226
City Deep	150	9	44,200	85,180
Nourse Mines	260	7	52,000	82,542
Robinson Deep	160	10	58,300	81,981
Simmer and Jack	320	7	79,100	80,605
Totals	4415	145	1,118,940	£1,671,672

GROUP PROFITS.

The following are the profits returned for February, March and April by the mines controlled by the different groups:—

	February.	March.	April.
Rand Mines (Eckstein)	£233,575	£255,230	£230,259
Rand Mines (Subsidiaries)	241,809	280,177	279,065
Robinson group	84,609	96,588	95,221
Gold Fields group	93,347	110,756	111,229
East Rand Proprietary	89,514	95,010	95,204
Barnato group	74,114	81,152	82,250
General Mining group	63,107	63,830	64,776
Neumann group	46,112	51,917	56,827
Cons. Mines Selection	37,407	30,116	24,305
Kleinfontein group	23,891	25,002	29,944
Goerz group	10,317	8,554	8,860
Totals	£1,002,802	£1,098,332	£1,077,940

INCREASES AND DECREASES.

The following returns of the April output have been filed with the Chamber of Mines. Increases and decreases compared with March are subjoined:—

The Witwatersrand.

	March. £	April. £	Inc. £	Dec. £
Aurora West	18,796	18,851	55	—
Bantjes	40,413	33,302	—	7,111
Brakpan	81,153	76,243	—	4,910
Cinderella	23,872	21,965	—	1,907
City Deep	87,393	85,180	—	2,213
City and Suburban	52,375	51,028	—	1,347
Crown Mines	299,520	297,073	—	2,447
Consolidated Langlaagte	59,362	63,334	3,972	—
Cons. Main Reef	33,723	34,564	841	—
Durban Deep	38,374	39,190	816	—
Durban Roodepoort	15,186	15,173	—	13
E.R.P.M.	255,811	253,959	—	1,852
Ferreira Deep	122,275	120,249	—	2,026
Geduld	17,509	18,286	777	—
Geldenhuis Deep	87,373	90,226	2,854	—
Ginsberg	20,869	20,007	—	862
Glencairn	16,885	16,838	—	47
Knight Central	26,663	28,719	2,056	—
Knights Deep	82,274	79,938	—	2,326
Jumpers-cum-Treasury	12,756	11,380	—	1,376
Jupiter	46,177	43,616	—	2,561
Langlaagte Estate	59,243	60,331	1,088	—
Luipaardsvlei	18,766	18,694	—	72
May Consolidated	15,330	14,922	—	408
Main Reef West	30,694	31,166	472	—

	March. £	April. £	Inc. £	Dec. £
Meyer and Charlton	33,684	33,820	136	—
Modder B.	66,192	61,227	—	4,965
New Goch	28,277	27,908	—	369
New Heriot	20,398	21,884	1,486	—
New Kleinfontein	73,205	77,313	4,108	—
New Modderfontein	102,192	100,879	—	1,313
New Primrose	36,271	36,233	—	38
New Rietfontein	18,898	18,652	—	246
New Unified	16,808	16,652	—	149
Nonrse Mines	84,475	82,542	—	1,933
Princess	29.250	27.857	—	1,393
Randfontein Central	282,160	275,843	—	6,317
Robinson	110,033	103,186	—	6.847
Robinson Deep	86,170	81,981	—	4.189
Roodepoort United	24.140	25.240	1,100	—
Rose Deep	94,911	99,949	5,038	—
Simmer and Jack	79,297	80.605	1,308	—
Simmer Deep	55,233	53,152	—	2,081
Spes Bona	6,359	6,193	—	166
Van Ryn	50,009	55,497	5,488	—
Village Deep	73,443	74,051	608	—
Village Main	71.269	71,268	—	1
Vogelfontein Estate	16,333	16.566	233	—
Witwatersrand	50.251	51.453	1,202	—
West Rand Central	3,054	2,956	—	98
Witwatersrand Deep	59,175	64,663	5,488	—
West Rand Consolidated ...	43,501	45.960	2,459	—
Wolhuter	36,365	37.796	1.431	—
Miscellaneons	15,516	15,123	—	393
Outside Districts.				
Barrett	556	917	361	—
Ceylon Lydenburg	—	1,338	1,338	—
Glynn's Lydenburg	8,249	5,739	—	2,510
Nigel	20,143	20,389	246	—
Quest	—	3,318	3.318	—
Sheba	12.811	13,499	688	—
Sub-Nigel	9.701	10,080	378	—
Trans. G. Estate	42.603	40.413	—	2.190
Worcester	5.004	5,518	514	—
Miscellaneous	29.330	22,465	—	6.865

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Witwatersrand.				
Aurora West	11,290	80	4,438	£18,851
Bantjes Consolidated	28,000	100	7,840	33.302
Brakpan Mines	53,870	160	17,919	76.243
City Deep	44.200	150	20,053	85.100
City and Suburban	26,800	150	12,013	51,028
Cinderella Consolidated ...	17.900	80	5,171	21,965
Cons Langlaagte Mines ...	45,300	100	14,910	63,374
Cons. Main Reef	23,380	110	8,137	34,564
Crown Mines	196,600	660	69,937	297,073
Durban Roodepoort	14,082	90	3,572	15,173
Durban Roodepoort Deep	26,000	100	9,226	39,190
E.R.P.M.	162,000	820	59,787	253.959
Ferreira Deep	55,110	250	28,309	120,249
Geldenhuis Deep	60,300	300	21,241	90,226
Ginsberg	15,025	80	4,710	20,007
Glencairn Main Reef	20,337	160	3,964	16,838
Geduld Prop. Mines	13,800	50	4,305	18,286
Jupiter	43,100	120	10,268	*43,616
Jumpers-cum-Treasury ...	5,700	55	2,679	*11,380
Knights Deep	104,800	400	18,819	79,938
Knight Central	25,420	110	6,761	28,719
Langlaagte Estate	53,570	200	14,203	60,331
Luipaardsvlei Estate	16,910	60	4,401	18,694
Main Reef West	21,180	100	7,337	31,166
May Consolidated	15,330	100	3,513	14,922
Meyer and Charlton	14,467	75	7,962	33,820
Modderfontein "B"	34,020	80	14,414	61,227
New Goch	27,800	120	6,570	27,908
New Heriot	12,500	70	5,152	21,884
New Kleinfontein	51.800	200	18.201	77,313
New Modderfontein	52,200	180	23,749	100,879
New Primrose	25,300	160	8,530	36,233
New Rietfontein Estate ...	16,050	120	4.391	18,652
New Unified	12,305	60	3.920	16,651
Nourse Mines	52,000	260	19,432	82,542
Princess Estate	21.700	60	6.558	27,857
Robinson	59,500	250	24,292	103,186
Robinson Deep	58,300	160	19,300	*81,981
Randfontein Central	230,820	865	64.939	275,843
Roodepoort U. Main Reef	26,865	50	5.942	25.240
Rose Deep	68.810	300	23,530	99,949
Simmer Deep	65,950	180	12,513	*53,152
Simmer and Jack	79,100	320	18,976	80,605
Spes Bona Tribute	6.219	40	1,458	6,193
Van Ryn Gold Mines ...	39.040	140	13.065	55,497
Village Deep	49,100	180	17,433	74,051
Village Main Reef	38,300	220	16,778	71,268
Vogelstruis Estates	13,027	80	3,900	16,566
West Rand Central	2,103	20	696	2,956
West Rand Consolidated	32,000	100	10,820	45,960
Witwatersrand	36,920	220	12,113	51,453
Witwatersrand Deep	43,000	245	15,223	64,663
Wolhuter	28,900	120	8.898	37,796
Miscellaneous producers ...	—	—	—	15,123
Outside Districts.				
Heidelberg—				
Nigel	13,000	75	4,800	20,389
Sub-Nigel	4,700	20	2,373	10,080
Barberton—				
Barrett	—	—	216	917
Sheba	6.340	60	3,178	13.499
Worcester Exploration ...	6.050	40	1.299	5.518
Lydenburg—				
Ceylon Lydenburg	632	5	315	1.338
Glynn's Lydenburg	3.067	20	1,351	5.739
Transvaal G.M. Estate ...	11,760	75	9,511	40,413
Klerksdorp—				
Quest	3,957	35	781	3.318
Miscellaneous producers ...	—	186	—	22,465

* Jumpers-cum-Treasury does not include 256 ozs., value £1,087, taken from reserve and declared in output. * Jupiter does not include 250 ozs., value £1.062, taken from reserve and declared in output. * Robinson Deep does not include 168 ozs., value £713, taken from production and added to reserve. * Simmer Deep does not include 250 ozs., value £1.062. taken from reserve and declared in output.

The Kaoko Field, German South-West Africa.

The Kaoko Field, German South-West Africa, is the subject of an interesting article by Dr. Ingenieur C. Krause in the February number of the *Zeitschrift für praktische Geologie*. As regards the prospects of ore discoveries, Dr. Krause states that recent explorations have proved that there are many more varieties of ores in the Kaoko field than has hitherto been believed. It is only the Kaoko strata which appear to be barren of useful minerals; all the other formations show many clear indications of the presence of various metals. In the primary formation many ore occurrences may be expected. So far gold, iron, copper and lead ores have actually been found, while on the granite banks tins, wolfram and molybdenum deposits, as well as all metals originating in acid magmas, are almost certain to occur. The Otavi strata are already well known by the Tsumeb copper occurrences, and the extensive rich iron ore deposits of the Kaoko field. In addition to these, the possibility of lead, zinc and gold discoveries is by no means excluded. The sand and lime deposits of recent origin in German South-West Africa are known all over the world by the diamond fields of Lüderitzbucht. Besides diamonds, it is quite possible, to judge by geological indications, that the coast sands of the Kaoko field contain several other minerals, such as tantalite and monazite.

New Goch.

Revenue £83,663 1s. 2d., or 20s. 7·402d. per ton from 81,160 tons milled; cost £64.779 1s. 7d., or 15s. 11·560d. per ton; profit £18,884 2s. 7d., or 4s. 7·842d. per ton; capital expenditure, £996 15s. 4d. The working profit is £4.422 11s. 4d. in excess of that for the previous quarter.

The HIGHEST SALARIES

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers and Engine-Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings, corner Eloff and Pritchard Streets, Box 2061.

Rhodesian Section.

LATEST MINING NEWS.

Mr. Temby and the Tati Concessions—Wankie Coal—The Bell Reef—London and Rhodesian Mining—The Globe and Phoenix Meeting—The Lonely's Quarterly Report - Developments at the Pickstone.

Mr. E. T. Temby, one of the directors of Tati Concessions, Ltd., has just issued a lengthy report to the shareholders on the operations on and prospects of the company's property. His reference to mining include the following:—Labour is assured. Under the new rules and regulations, prospectors are now busy, and have discovered several reefs. The directors are not entering into mining speculations themselves (this was made quite clear from Mr. Thomas's recent speech), a decision which has Mr. Temby's entire approval. Under former management nearly £200,000 has been invested in two or three of the principal mines. Of these, the directors desired to obtain control, and have done so, and have even incurred a small outlay on development, prior to handing the properties over to subsidiary companies. There is, for example, the Monarch mine, which has produced over £61,000 worth of gold, extracted from about 54,000 tons, exclusive of what was in the tailings. The actual recovery was well over 30s. per ton. The reef has been consistent, but has not yet been properly opened up or developed in depth. There are blocked out and developed no fewer than 50,000 tons of a value of 30s. per ton, and, at the deepest point reached, the width is 9 ft. and the value 25s. 6d. per ton. Mr. Temby favours active development. Then there are the Durham Prospect gold mines, where, in the New Zealand mine, the profit-earning stage has been already reached.

*   *   *   *

At a meeting of the Rhodesia Scientific Association, held in Bulawayo on the 16th ult., an interesting paper by Mr. B. Lightfoot (of the Rhodesia Geological Survey) was read on the geology of the Wankie Coal-field, illustrated with lantern slides. A short account of the general distribution of the coal-bearing series in Rhodesia was first given, the coal areas being confined to the low-lying basins of the Limpopo and Zambesi rivers and their affluents. After a summary of the discovery and development of the field, the physical features of the Wankie district were described. It is a denuded tableland, originally of a height of about 3,000 ft. which has been dissected by the Deka river and its tributaries. The general geological structure was next described and was illustrated by a map showing horizontal and vertical sections. The succession of rocks in the district is:—Batoka basalts, minimum thickness 1,000 ft.; gap represented by Deka fault; (?) forest sandstones, 100 ft., top not seen; escarpment grits, 300 ft.; Madumabisa shales, 750 ft.; upper Wankie sandstone, 100-200 ft.; silicified fireclay, 50-80 ft.; coal shales, 80 ft.; lower Wankie sandstone, 200; unconformity, sheaved granite and gneiss. The rocks divide themselves naturally into two groups, the sheaved granite below forming the floor upon which the second group of flat lying sediments and lavas rest in great discordance. The younger rocks by the discovery of fossil plants on two horizons are now definitely shown to belong to the Karoo system. The chief structural feature of the coal-field may be summed up as step faulting. The coal series is faulted in to the south against the sheaved granite, and after a few miles of flat-lying coal series, the important Deka fault throws down the Batoka Basalts which occupy all the tract of country up to and beyond the Victoria Falls. The general characters of the different rock series were next described in detail, most attention being paid to the coal shales. The coal worked at the mine always occurs at the base of the coal shale group and varies in thickness from 7½ to 13½ ft. in the workings. It dips at about 2½ inches to the yard to the north, and is worked by the pillar and stall method. About 1½ million tons are exposed in the development faces of the mine. The reserves of coal are enormous. In the area mapped the estimated area between the outcrop and the faults is 150 square miles, *i.e.*, containing about 600 million tons of coal. Two higher seams of coal occur. The five-foot seam is about 23 ft. above the Wankie seam, and a still higher seam is found at the base of the Madumabisa shale series. These are not worked. The coal is of excellent quality, and has a high calorific value, being superior to any Transvaal coal, equal to the best Natal and American coal, and, but for its high percentage of ash, would be equal to Welsh coal. Evidence was brought forward to show that the coal was of drift origin. The other economic products of the field were mentioned, and short descriptions of the coke, fire-bricks, building stone, etc., were given.

*   *   *   *

The following is a copy of a cablegram despatched by the local office of the Bell Reef Development Co. to the head office in London, dated the 1st inst.:—"Have cut reef in No. 7 level: average of three samples taken is 47·3 dwts. over 34 inches," thus confirming the recent reports of good development on this property.

*   *   *   *

Recent cable:—Radnor Mine: Shaft No. 1: shaft sunk 9 ft., total 17 ft. Below No. 2 level, the first 15 ft. assaying 10 dwts. per ton over 66 ins. East drive on parallel reef off cross-cut No. 1 drive extended 31 ft., a total of 45 ft. Reef 42 ins. wide assaying 1 oz. per ton from 10 ft. to 30 ft. and assaying 5½ dwts. per ton oven 30 ins. from 30 ft. to 43 ft. West drive on parallel reef: drive extended 23 ft., a total of 23 ft.; reef 30 ins. wide assaying 2 dwts. 18 grs. per ton over the first 18 ft. Winze 70 ft. west. Winze sunk 14 ft., a total of 14 ft.; reef 48 ins. wide, assaying 1 oz. 12 dwts. per ton over the first 10 ft., width of reef not fully exposed.

*   *   *   *

As a sequel to the agitation in connection with the Globe and Phœnix Gold Mining Company, Ltd., a large number of Scottish shareholders attended the annual meeting held in London on the 29th ult. Mr. T. B. Reynolds, chairman of the company, who presided, said there was no reason to doubt the ability to pay regular interim dividends, as the prospects of the mine were much brighter. A debate lasting two hours then ensued. The liveliest personalities were indulged in. Eventually the annual report was adopted, but the meeting was adjourned until May 20th, when the meeting will consider a resolution to reduce the directors' fees to £400 per annum, and will proceed with the election of directors, etc.

*   *   *   *

The report on operations on the Lonely Reef for the quarter ended the 31st December last, is signed by the general manager, Mr. Francis Drake. The operations at the company's property may be summarised as follows:—Ore reserves at end of quarter, 174,529 tons; average assay value of ore reserves, in gold per ton, 22·4 dwts.; total tons milled, 10.212; tons milled per running day, 133; tons milled per stamp per day, 8·8; total yield in ounces of fine gold, 9,676·483; yield in dwt. of fine gold per ton milled, 18·95. The development footage is greater than that of the last quarter and the ore reserves have been increased. The ore milled and the output are less for reasons given later. Driving has been confined to the No. 6, No. 8 and No. 9 levels. The ore reserve was increased during the quarter by 14,110 tons, making a total of 174,529 tons. The assay value of this works out at 22·4 dwts. per ton, being ·36 dwt. lower than at the end of the last quarter. This tonnage and value is calculated from the widths and assays of the samples taken, with 12 inches of barren wall rock added, and has been re-calculated and former calculations checked, as it is the end of the company's financial year. The ore developed ready for stoping amounts to 148,238 tons, being an increase on that which we had at the end of the July quarter of 9,099 tons. The ore developed stands in our books at 2s. 8·5d. per ton; but as will be seen from the statement attached, is charged out at the rate of 3s. per ton. The milling has been subject to considerable lost time on account of scarcity of water during November and December. Advantage has been taken of the various stoppages to repair the mill engine and connect it with the new evaporative condenser. The engine is now in first-class condition, and we are already making a considerable saving in expenditure for fuel owing to the condenser. The working cost for the quarter, including all administration expenses in London and Bulawayo, but not including royalty to the B.S.A. Company, is just under 33s. 6d. per ton. This is a higher figure than that of the July quarter, and is accounted for chiefly by the lesser tonnage treated, and to some extent by the total cost of relining the No. 2 tube mill and of replacing the wrecked portion of the mill engine, being charged out during the quarter. Now that we are in a position to mill to our full capacity there should be an appreciable reduction made on these figures, and when the additional stamps are working, thus increasing our monthly tonnage, a further redection per ton will be made. The capital expenditure amounted to £8,064 17s. 8d. I hope during the next three months to have the additional five stamps erected. When these are in, we should be able to crush nearly, if not quite, 5,000 tons per 28 days of running time.

* * * *

The Salisbury correspondent of the *Rhodesian Mining Review* writes:—A report for the month of March on the Pickstone Gold Mines, Ltd., by their managing director, Mr. MacDonald Stokes, goes far to confirm all that has been said and written about this wonderful little mine. In the way of development 198 feet were driven and sunk during the month, whilst, at the new main vertical shaft of the Pickstone West, the long-looked-for air compressor plant has been at last installed. The rock here continues to be hard, and only 10 feet have been sunk, though an improvement, says Mr. Stokes, is expected when the working of the air drills is better understood by the natives. As regards milling, two Tremains ran 264 hours, and ten gravity stamps 336 hours. The total gold recovered from milling and cyaniding was 686 ozs.—value £2,887. The number of tons milled and cyanided was 780 and 546 respectively. On the 19th March the new reduction plant of ten new gravity stamps began working, and have since been running continuously both day and night. The Tremain mills have ceased running, but two new Chilians are in course of erection, which, when completed, will of course materially add to the output. The profit for the month, after allowance for depreciation, is about £1,580. This, however, may be expected to be substantially increased when the Chilians get to work. The company has just declared another interim dividend of 5 per cent.

Rezende Mines.

Particulars of output of the Rezende Mines (Rhodesia) for the month of April, 1913, showing a total profit of £2,539, made up as follows:—Rezende Section: Tons milled, 3,800; total ozs. fine gold recovered, 1,431; estimated value of yield (gold and silver), £6,128; estimated profit after deducting London expenses, £1,420; add revenue from tributors, £523; estimated profit from Rezende section, £1,943. Penhalonga Section: Tons milled, 5,800; total fine gold recovered, 844 ozs.; estimated value of yield (gold, silver and lead), £4,545; estimated profit, after deducting London expenses, from Penhalonga section, £596; total estimated profit, £2,539.

MINING MEN AND MATTERS.

Mr. R. R. Hollins and Mr. D. Burnett have left for Rhodesia.

* * * *

Mr. Mitchell, lately of the Cinderella, has been appointed manager of the Langlaagte Estate.

* * * *

Mr. Lewis Kelsey has been appointed secretary of the Chamber of Mines. He will also continue to act as legal adviser to the Chamber.

* * * *

The British South Africa Company announces that the Duke of Abercorn has been appointed a director of the company.

* * * *

Mr. G. R. Airth has left for London to take over the management of the Anglo-French Exploration Co., Ltd., there.

Hayes Reynolds Printing Co.

In connection with the fire at Hayes Reynolds Printing Works, the following cable message has been received by the local office from head office at Letchworth:—"Works completely burned down. Property fully insured, also standing charges for full year. All colour test formula and records saved."

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of April:—Tons crushed, 3,067, yielding 1,351 fine ounces; estimated value of month's output, £5,611; estimated profit for the month, £2,096. The decreased profit is due to the smaller tonnage crushed owing to shortage of labour and temporary decrease in grade recovered.

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THE WEEK IN THE SHAREMARKET.

Increasing Activity with Better General Tendency—Diamonds and Tin in Demand—Several Gold Stocks Improve.

The whole tendency of the market this week has been towards greater firmness and activity. Indeed, after the holidays local prices got momentarily ahead of London and showed a general advance. Though all Rand shares have been firm only a few specialities show marked increases. Van Ryn Deeps have been in demand, on the news of good development at the mine, and the approach of the milling stage. Brakpans and Coal Trusts have been stronger, and Springs Mines in increasing favour. The Consolidated Langlaagte debenture issue has been favourably received, and the success that has attended this and the Springs issue will, doubtless, lead to similar issues by other properties in the near future. Some of the Albu companies, for instance, may possibly adopt the idea; and of the Goerz companies, the Lancaster West might find it the simplest way to finance. Rand dividends are already being discussed; and some very good distributions are anticipated for the half-year. The fact that the peace negotiations in London must necessarily be protracted owing to the multiplicity of questions to be settled may damp activity for a little while, otherwise the long-neglected Kaffir market might reasonably expect a considerable accession of public interest.

The Tin Market.

The three leading tin stocks on the local market all enjoyed increased attention during the week, and after several minor fluctuations, all ended at higher levels. Zaaiplaats were a very active counter, but experienced some rapid changes in price. Rooibergs rose steadily, if more slowly, and were not so largely dealt in. Swazis likewise did not look back, and are higher on the week. One or two new tin flotations are promised, and though Leeuwpoort has not yet come on the market the mine is well spoken of, is about to start milling, and the shares promise to prove yet another interesting counter.

The Diamond Market.

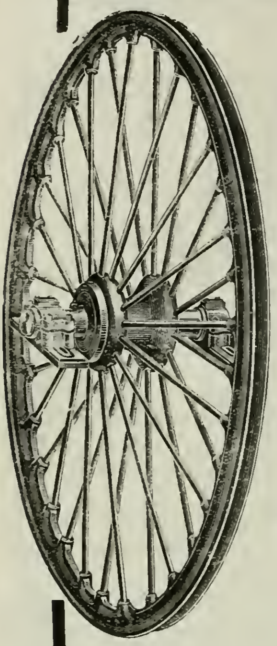
In diamonds there has been quite an abnormal amount of activity. All the big leaders are being bought from Paris and London; and the smaller fry have enjoyed an increasing measure of reflected favour. The market for the stones was never better, and the fact that some of our doting old Senators at Capetown have advised in favour of a ten per cent. export tax on uncut diamonds it not taken seriously. The Government is not likely to accept any recommendation so clearly against the weight of evidence. Led by Frank Smiths, which are about to commence washing, all diamond shares have been in demand this week, and it is believed that we are on the eve of a big rise in the market valuation of all diamond producers The signs are certainly propitious.

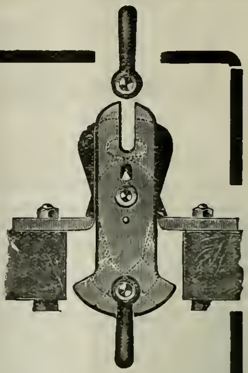
* * * *

	Friday, 9th.	Sat., 10th.	Tues., 13th.	Wed., 14th.	Thurs., 15th.
African Farms.	16 8B	16 9	17 0	17 3B	17 3
Apex Mines	25 6B	26 6B	26 6B	26 6B	27 0
Bantjes Consolidated	20 6	20 6B	21 3	21 9B	21 9B
Benoni Consolidated	3 3B	3 3B	3 3B	3 3B	3 3B
Blaauwbosch Diamonds	106 3B	110 0B	110 0B	110 0B	110 0B
Brakpan Mines	80 6B	81 0B	80 0B	81 0B	81 0B
Breyten Collieries	31 0B	31 0B	32 0S	31 0S	—
Bushveld Tins	—	0 10B	—	0 10B	0 10B
Cassel Coals	—	—	—	—	14 0B
City & Suburban (£4)	49 6B	50 0B	50 6	50 3B	50 6B
City Deeps	69 0B	68 0B	68 0	68 0B	67 6
Cloverfield Mines	6 3B	6 4	6 5	6 5	6 5
Clydesdale Collieries	8 6	—	12 0B	—	—
Concrete Constr.	—	4 0B	4 0B	—	—
Consolidated Investment	—	—	—	—	21 6B
Consolidaten Langlaagtes	27 6	27 6B	27 6B	28 0B	—
Consolidated Main Reefs	18 6B	18 9B	19 3	19 0	18 9
Consolidated Mine Select	12 0B	—	—	—	—
Coronation Colls.	—	—	15 0B	—	—
Coronation Freeholds.	0 5B	0 5B	—	—	0 4B
Coronation Syndicate	3 6B	3 6B	3 6B	3 6B	3 6B
Crown Diamonds	8 3B	8 9B	9 3	9 3	9 0B
Crown Mines	150 0B	—	—	—	—
East Rand Centrals	9 6B	9 9	9 9B	—	—
East Rand Coals (2/6).	1 9B	1 9B	1 9	1 9B	—
East Rand Deeps	2 4B	2 59	2 5B	2 4B	2 4B
East Rand Mining Estates B	—	7 0B	—	—	—
East Rand Props.	56 0B	—	57 0B	58 0S	58 0*
East Rand Debs.	£95S	£93B	£95S	£95S	—
Eastern Golds (1/-)	1 8B	1 8B	1 9B	1 9B	—
Frank Smith Diamonds	11 9	13 0B	15 0	14 6	14 3
Geduld Props.	24 0B	24 9	25 6	25 3	25 6
Geldenhuis Deeps	—	35 0S	—	33 6B	—
General Mining	18 6S	18 6S	—	—	16 9S
Glencoe (Natal) Colls.	7 0B	7 3B	7 0B	7 0B	7 3B
Glynn's Lydenburgs	—	—	20 6S	18 6S	—
Government Areas	22 0B	23 0	23 3	23 3	23 0
Hex River Expls.	0 6B	—	—	0 6B	0 6B
Jumpers	4 0B	—	4 0B	5 0S	4 0B
Jupiters	11 0B	11 0B	11 0B	11 0B	11 0
Kaalfontein D. (2/6)	—	—	0 4S	—	0 4S
Klerksdorp Props.	2 8B	2 9	2 9B	2 9B	2 8B
Knight Central	12 9	12 9	13 0B	12 9B	12 9
Lace Props.	3 8B	3 9	3 9B	3 10	—
Luipaardsvlei Estate	8 6B	—	—	—	9 0
Lydenburg Gold Farms	2 9B	2 9B	2 10B	3 0	3 0
Main Reef Wests	12 6B	13 0B	13 3	13 0	12 9
Main Reef West Debs.	£80B	—	£78B	£80B	£80B
Messina Development	—	—	—	25 0B	—
Meyer & Charltons	108 9B	108 9B	—	—	—
Middlevlei Estates	1 3B	—	1 2B	1 2B	1 1
Modder B's	79 6B	—	81 6S	81 6	81 0B
Modder Deeps	37 3	37 0	37 0B	36 9B	37 6S
Natal Navigation Colls.	—	—	16 0S	15 0B	—
New Boksburgs	1 6	—	1 3B	—	1 0B
New Eland Diamonds	—	—	27 6B	29 6	30 0S
New Era Cons. (5/-)	8 0	8 0B	8 0B	8 0B	8 0B
New Geduld Deeps	2 6	2 5B	2 4B	2 4B	2 4B
New Heriots	78 0B	78 0B	—	—	—
New Kleinfonteins	24 0	24 0	23 9	23 6B	23 3B
New Modders	270 0B	—	—	—	275 0S
New Rietfonteins	5 6B	—	—	—	—
New Unifieds.	16 0S	—	—	—	—
Nigels	17 6B	—	22 0B	20 6B	20 0B
O.F.S. & Transvaal Dia.	1 8B	1 8B	1 8B	1 9	1 9
Premiers Def. (2/6)	—	—	235 0B	—	240 0S
Premier Pref. (5/-	—	—	175 0B	175 0B	180 0B
Pretoria Cement Co.	52 6B	53 0B	52 6B	52 6B	52 6B
Princess	8 0S	—	7 0	—	7 0B
Rand Collieries	7 3B	—	—	—	—
Rand Klips	—	1 11	1 10B	1 11	1 10B
Rand Nucleus	2 8	2 6B	2 7B	2 8B	2 8
Randfontein Deeps	6 0S	5 0B	6 0S	5 3B	5
Randfontein Estates	29 0B	29 0B	29 6B	29 6B	29 6
Roberts Victors	—	32 6B	32 6B	35 0B	33 9B
Robinson Deeps	40 0B	40 6B	41 0B	42 0S	40 0B
Rooiberg Minerals	37 9	38 0B	38 9	37 9B	38 3S
Rood. Durban Deeps	—	—	—	25 0S	—
Ryan Nigels	3 9S	—	—	3 6B	—
Salisburys	—	—	—	1 6B	—
Shebas	5 0B	5 0B	—	5 0B	5 0B
Simmer Deeps	—	2 9B	3 6S	2 9B	3 0
Solomon's Temple Tin	0 6	—	—	0 6S	—
S.A. Breweries	—	40 0B	40 0B	40 0B	40 6B
S.A. Lands	4 1B	4 2	4 1	4 1B	4 1
Springs Mines	15 9B	16 0	—	17 0	16 6B
Sub Nigels	13 0B	13 9B	14 0S	13 9B	13 6B
Swaziland Tins	46 0	47 6	48 0	48 6B	47 6B
Transvaal Coal Trust	48 0B	48 0B	48 0B	48 9B	47 6B
Transvaal Cons. Lands	—	—	—	—	27 6B
Transvaal G.M. Estates	—	53 0B	53 0B	—	53 0B
Tudors.	2 0S	1 6B	—	2 0S	1 6B
Van Dyks.	2 6B	—	—	—	—
Van Ryn Deeps	30 3	30 9B	31 6	32 3	32 6
Village Deeps	—	43 0B	44 0S	45 0S	—
Vogel. Cons. Deeps	2 0S	2 0S	2 0S	2 0S	—
West Rand Estates	4 0B	—	3 6B	4 0	—
Witbank Collieries	45 0B	—	—	44 0B	—
Witwatersrands	71 0B	71 0B	71 0B	70 0B	72 0B
Wit. Deeps	61 0B	63 6S	63 6	63 6	62 9B
Wit. Townships	—	—	—	—	26 0B
Wolhuters	16 0	—	16 0B	—	15 9B
Zaaiplaats Tins	41 3	43 9	45 0	43 0	42 9

B Buyers. S Sellers.

B Buyers. B Sellers. * 50 Shares.





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Engineering Notes and News.

STANDARDISATION OF ELECTRIC EQUIPMENT.—II.

Sec. 4.—Protection.

Rule 23.—Fire Buckets.—Fire buckets filled with clean, dry sand shall be kept where stationary electrical apparatus is located, ready for immediate use, and regularly inspected once every month. The provision of tetrachloride fire extinguishers is recommended.

Rule 24.—Resuscitation.—Instructions shall be placed at the mine entrance, and in every generating, transforming, and motor house, for the resuscitation of persons suffering from electric shock. All employees operating the electrical apparatus shall be required to acquaint themselves with these instructions.

Rule 25.—Recording Accidents.—Every personal accident occurring in connection with the operation of the electrical equipment shall be promptly reported by the person injured, or by some other person on his behalf, to the mine superintendent, and shall be recorded by him at the office of the mine.

Rule 26.—Plans.—A plan on a scale not smaller than 200 feet to the inch shall be kept at the mine, showing the position of all permanent electrical machinery and fixed cables or conductors in the mine, and shall be corrected as often as may be necessary to keep it as nearly as practicable up to date, and never more than six months in arrears.

Sec. 5.—Haulage.

Rule 27.—Location of Wires in Roadway.—In underground roads, the trolley wires shall be placed as close to the side, and as straight as practicable, and securely supported at frequent intervals. In all roads where it is necessary for men to travel on foot, all wires, except signal wires, must be placed on the same side of the roadway. The trolley wire shall not be less than six feet from the top of the rail unless protected from casual contact of passersby by suitable shield or trough.

Rule 28.—Protection of Cables.—Where the cables in main haulage roads, where persons are hauled into or out of the mines cannot be kept at least 18in. from any part of the car, they shall be specially protected. Cables and wires, unless provided with metallic coverings, shall not be fixed to walls or timbers by means of noninsulating fastenings. Where main or other roads are being repaired, or where blasting is being done, temporary protection must be used so that the cables are protected from damage.

Sec. 6.—Lighting and Signal Wires.

Rule 29.—Erection of Lighting and Signal Wires.—Small wires for lighting or signal circuits shall either be conveyed in pipes or casings, or they may be suspended from porcelain or glass insulators or securely tied to them, so that they do not touch any timbering, rock or metal. On no account shall staples be used. If metallic pipes are used, they must be grounded and well drained. If separate unincased wires are used, they shall be kept at least three inches apart, and not brought together except at lamps or fittings.

Sec. 7.—Blasting.

Rule 30.—Shotfiring.—Electricity from light and power circuits shall not be used for firing shots in a mine except where electrical connection to such light or power circuit is made within an inclosed switch room, which shall be kept securely locked and shall be accessible only to the authorised shotfirer. If electricity from light or power cables is used for firing shots in a mine, no shots shall be fired until all the men are out of danger. Special precautions must be taken to prevent accidental contact between shotfiring cables or wires and power and lighting cables. Only persons authorised in writing by the mine foreman or superintendent are permitted to fire shots electrically in a mine.

Rule 31.—Battery or Magneto Exploders.—Where battery or magneto exploders are used, they shall be inclosed in a suitably constructed box, fitted with a removable connecting plug or key without which the circuit cannot be closed. This plug or key shall be detached when not required for firing, and shall not under any conditions pass from the personal custody of the shotfirer while on duty. Exploders shall be frequently tested by the shotfirer to insure that they give the necessary pressure and current. The exploder shall not be connected to the shot-firing cable until all other steps preparatory to the firing of the shot have been completed and all persons have removed to a place of safety. Immediately after the firing of the shot the firing cable shall be disconnected from the exploder, and no person shall approach a shot that has been attempted to be fired by electricity and has failed to explode until the firing cable has been disconnected and an interval of five minutes has elapsed since the last attempt to fire the shot.

Sec. 8.—Telephones.

Rule 32.—Telephone Systems, When Required, How Installed.—All mines from which exit is by shaft only, and all others in which the working places extend more than one mile from a place of exit, shall be provided with an underground telephone system, provided the number of underground employees at any one time on the regular working force exceeds 25. The system shall be of approved construction, and of such extent that no working place shall be at a greater distance than three-fourths of a mile from a telephone; principal shaft stations shall be provided with telephones. All main telephone cables shall be insulated with waterproof insulation, and unless run through metal pipes or casings, or approved conduit, they shall be protected by a continuous lead sheath.

New Patents.

56. (1) Edward Arthur Mellinger, (2) Bernard Darwin Willis, (3) Talbot Grant Martin, (4) Stanley Gordon Sinclair Dicker.—Improvements in or relating to telephone systems.
57. France Conrad du Preez, (2) James Fossey Steel.—Electric time switch.
58. J. F. Botha.—Improved school inkpot.
59. Charles Henry Perrins.—A new and improved method or soldering aluminium by means of a solder.
60. Albert John Ash.—An embrocation.
61. Louis L. Shedl.—Improvements in jockeys or rope grips for mechanical haulage system and the like.
62. Frederick Haisman.—
63. Fridolf Frankel.—Improvements for stretching a resonant plate over a frame.
64. Louis Robert Vierdag.—A new method of printing and writing music.
65. Louis Doyen.—Process for treating wood surfaces.
66. Robert Howe Gould.—Improvements in electrical burglar alarms and like devices.
67. Ernest Shaw.—Improved means for decanting petrol, kerosene or true like fluid into the fuel tanks of motor cars or other receptacles.
68. (1) Thomas Galbraith, (2) Otto Nest.—Combined water jet and spray nozzle; also spray nozzle.
69. Robert Percy Sewers.—Improvements in the construction of engine propellers as used for the propulsion of aeroplanes, flying machines and the like.
70. (1) William Routledge, (2) Gaston Jacquier.—A new or improved match or equivalent inflammable appliance applicable for use as a substitute for ordinary matches and as a lighting attachment for cigarettes cigars, and the like.
71. Frank Hill.—Patent hoop-iron binding machine.
72. (1) William Thomas Anderson, (2) Christopher Loombs, (3) Percy Ralph Nethersole.—Improvements in treating mine dumps for allaying dust.
73. (1) George Thomas Hill, (2) Charles Graham Stone.—Improvements in or appertaining to the manufacture or preparation of Portland cement.
74. Fabian Mercer Cox.—A hand gravitating machine for alluvial diamond recovery.
75 Harry August Stockman.—Improvements in feeding means for machines for washing and concentrating diamond bearing material; alluvial metalliferous matter and the like.
76. Wilhelm Mauss.—Improvements in centrifugal separators.
77. James Howard Vivian.—Improvements in mountings for the feed screws of rock drilling machines.

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NEW S.A.R. ENGINE PROGRAMME.*

The new S.A.R. locomotive programme for 1913-1914 is probably the most comprehensive of any in the history of South Africa, embracing, at it does, no less than 113 new locomotives, which number is made up as follows:—10 engines—Class 4—A; 8 engines—Class 12; 20 engines—Class 14; 20 engines—Class 14—A; 10 engines—Class 15; 12 engines—Class 16; 15 engines—Class MC—1; 10 engines—Class MJ; 8 engines—for 2ft. gauge lines; total, 113 engines. With the sole exception of the 2 feet gauge engines, the whole of the above-mentioned locomotives are to be equipped with superheaters of the Schmidt type. The ten Class 4—A engines are, to all intents and purposes, a repeat order for the Class 4 (4-8-2 tender type), built to the designs of Mr. Beatty, the late chief locomotive superintendent of the Cape Government Railways, but equipped with superheaters and fitted with piston valves and Walschaert valve gear in lieu of the "D" valve and Stephenson link motion arranged on the engines now in service. The order for these engines has been placed with the North British Locomotive Company, who are due to commence delivery in July; consequently, they may be expected in this country towards the end of August. They will be erected at Salt River. The Class 12 engines, which may be expected to arrive in the course of a few weeks, are also being built by the North British Locomotive Company, and are also a repeat order, identical with the eight engines of the same class working in the Transvaal and Natal Provinces. A full description of this class of engine has already appeared in these pages. To a very large extent the Class 14 engines are a new [illegible] being the outcome of the experience gained with the Classes 3—B and 12; like these, they are of 4-8-2 tender type and arranged on somewhat similar lines with a view to interchangeability of parts. The following are the principal dimensions:—Cylinders. 22in. x 26in. stroke; diameter of boiler inside at first ring, 5ft. 7½in.; distance between tube plates, 19ft.; heating surface (approximate), firebox, 149·54 sq. ft.; heating surface (approximate), tubes (large), 656·59 sq. ft.; heating surface (approximate), tubes (small), 1,555·68 sq. ft.; superheater area (approximate), 636·84 sq. ft.; total heating surface (approximate), 2,998·65 sq. ft.; grate area, 36 sq. ft.; boiler pressure, 185 lbs. per sq. in.; total wheelbase of engine, 30ft. 7in.; total fixed wheelbase, 12ft. 9in.; total length of frames, 37ft. 9in.; diameter of leading bogie wheels, 2ft. 4½in.; diameter of coupled wheels, 4ft.; diameter of trailing bogie wheels, 2ft. 9in.; tractive effort (75 per cent. boiler pressure, 36,370 lbs. These engines are specially designed for service in the Natal Province on gradients of 1 in 30 (compensated), combined with 300 feet radius curves. The order for the Class 14 engines has been placed with Messrs. Robert Stephenson & Company, who expect to commence delivery about May and to complete the contract in August. In many respects the main line on the eastern section of the Cape Province, from East London, is very similar to the Natal line, the curves and gradients, however, being sligbtly easier. Unfortunately, the permanent way will not admit of the axle load of the Class 14 engine; consequently, to bring the weight upon the coupled wheels and within the fixed limit, it has been necessary to modify the design by reducing the boiler diameter; the Class 14—A engines are in all other respects exactly similar to the Class 14, and all the working parts and patterns are interchangeable. Of the 20 engines of this class, for which tenders are now being invited, five will work on the Cape Eastern Section, whilst the remaining 15 will be stationed in the Transvaal on the Low Veld. The enormous size of the passenger trains in the Orange Free State has necessitated the adoption of a new design known as Class 15, of which 10 are now on order and are being built by the North British Locomotive Company, and may be expected to arrive in this country towards the end of the year. These engines are of the 4-8-2 tender type, and, although not so heavy as the Class 12, are even longer. The following are the principal dimensions:—Cylinders, 22in. x 28in. stroke; diameter of boiler inside at first ring, 5ft. 4⅝in.; distance between tube plates, 21ft. 9in.; heating surface of firebox (approximate), 155 sq. ft.; heating surface of large tubes (approx.), 751 sq. ft.; heating surface of small tubes (approx.), 1,676 sq. ft; superheater area, 730 sq. ft.; total heating surface, 3,312 sq. ft.; grate area, 40 sq. ft.; boiler pressure, 185 lbs. per sq. in.; total wheelbase of engine, 33ft. 8in.; total fixed wheelbase, 15ft.; total length of frames, 41ft. 5in.; diameter of leading bogie wheels, 2ft. 4½in.; diameter of coupled wheels, 4ft. 9in.; diameter of trailing bogie wheels, 2ft. 9in.; tractive effort (75 per cent. of boiler pressure), 32,990 lbs. The necessity has also arisen for a fast passenger engine of a more powerful type than those at present in service in the Transvaal, and, consequently, an order has been placed with the North British Locomotive Company for twelve Class 16 engines. These engines are of the 4-6 2 type, following generally the outlines of the 4-8-2 type engines, Classes 12, 14, 14—A and 15, the following being the principal dimensions:—Cylinders, 22in. x 26in. stroke; diameter of boiler inside at first ring, 5ft. 4⅝in.; distance between tube plates, 18ft. 3in.; heating surface of firebox (approximate), 147 sq. ft.; heating surface of large tubes (approximate), 631 sq. ft.; heating surface of small tubes (approximate), 1,408 sq. ft.; superheater area, 600 sq. ft.; total heating surface, 2,786 sq. ft.; grate area, 36 sq. ft.; boiler pressure, 180 lbs. per sq. in.; total wheelbase of engine, 29ft. 5½in.; total fixed wheelbase, 10ft. 9in.; total length of frames, 36ft. 10in.; diameter of leading bogie wheels, 2ft. 6in.; diameter of coupled wheels, 5ft.; diameter of trailing bogie wheels, 2ft. 9in.; tractive effort (75 per cent. boiler pressure), 28,314 lbs. It is anticipated that these engines will be due for delivery in England in January next. A further fifteen Mallet type engines are on order for the Natal Province, similar in all respects to those built recently by the North British Locomotive Company (Class M—C), but equipped with superheaters. The order for these engines has also been placed with the North British Locomotive Company, who commence delivery in January next In order to distinguish these engines from those not fitted with superheaters, they will be known as Class MC—1. It is proposed, at an early date, to call for tenders for ten engines of the Mallet type for service on branch lines, to be known as Class MJ, particulars of which will be given at a later date. The gradual expansion of the 2 feet gauge lines also calls for a considerable increase of engine power in this direction, and Messrs. Kerr Stuarts have now in hand the construction of two side tank engines of similar type to those built by them recently for the Natal Province, whilst Messrs. Bagnall & Company, of Stafford, are now building a tender type engine, for the new Gamtoos branch, of similar design to those built by that firm for the Avontuur line. In addition to these, tenders have been invited for three more side tank engines for the Natal 2 feet gauge lines, and three tender engines for the Cape Province.

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*By E. R. Adams, in the *S.A.R. Magazine.*

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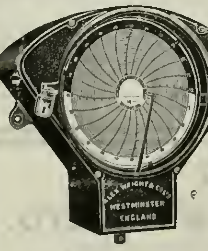

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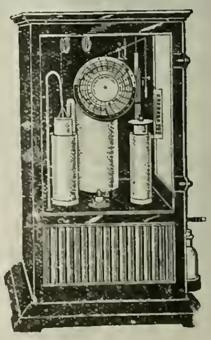

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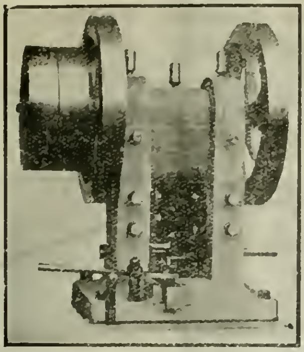

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Finance, Commerce, and Industries.

The Question of Credit.

Presiding at the annual meeting of the Merchants' Trust last week, Mr. J. Holcroft said that at the last annual meeting they drew attention to the reaction in trade circles which then appeared to be setting in, and they were bound to admit to-day that during the last twelve months merchants had incurred very heavy losses in bad debts. He regretted to say that the end did not yet appear to be in view. There was no doubt that the failure of crops, owing to the severe drought, had been a serious factor in affecting the outside towns and country storekeepers. The present position was one which required careful consideration by merchants in all sections of trade. It was, however, gratifying to note that the warning given last year to oversea shippers against granting indiscriminate credit was generally approved of, and steps taken to stop credit to undesirables. The money voted for the Johannesburg Chamber of Commerce examinations had been awarded to the successful candidates. He regretted, however, to record a miserable falling off in the number of students entering for those examinations, particularly in the important subjects of English, commercial arithmetic and geography. This was a serious matter, and he appealed to them to insist that apprentices attend classes for improving their knowledge, even if their employers have to pay the necessary fees.

* * * *

Addition to the Rennie Line.

In mail week there was launched from the yard of Messrs. David and William Henderson & Co., Ltd., Partick, Glasgow, the finely-modelled steel screw steamer, "Ingoma," which they have built to the order of Messrs. Thos. and Jas. Harrison, Liverpool, for their Harrison's Rennie Line of passenger and cargo steamers trading between London and South Africa. The dimensions of the vessel are 416 ft. by 52 ft. by 31 ft. moulded, with a gross tonnage of about 5,700 tons, and she is built in excess of the requirements of Lloyds Registry for their highest class. Handsome and up-to-date accommodation is provided amidships for over 100 first-class passengers, the state-rooms are large and airy, and every attention has been given to them that will add to the comfort of the passengers, including an electric fan to each room; to meet the modern demand many of these rooms contain single berths only, and a large number are specially adapted for the use of families travelling together. The furnishings and arrangements throughout are tasteful and attractive, the chief aim being to provide comfortable, roomy and well-ventilated travelling to the South African Dominion. The dining saloon, in enamelled white, extends the full width of the vessel, and will seat about 100 persons at small rectangular tables. The music room, also in enamelled white, is of neat and elegant design and the smoking room is in polished mahogany. Special attention has been devoted to the ventilation, which is, throughout the entire ship, of the most complete type and suitable for the special trade in which the vessel will be engaged. The vessel is fitted with wireless telegraphy, as are the other steamers of this line, which was the first to introduce the wireless system into the South African trade. A complete installation of electric light has been fitted throughout; refrigerating machinery and chambers for carriage of stores and cargo are also fitted. As the vessel is likewise intended to carry a large amount of cargo, every modern convenience for rapid handling is supplied. The machinery, which has been constructed by the builders upon the newest designs, is of ample power to drive the vessed at a high speed. This steamer will be a valuable addition to the fleet known as the "Rennie Line," now controlled by Messrs. Thos. & Jas. Harrison, which fleet

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(Incorporated in the Transvaal.)

NOTICE OF SPECIAL GENERAL MEETING OF SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that a Special General Meeting of the Shareholders of the above Company will be held on WEDNESDAY, THE 28TH DAY OF MAY, 1913, in the Board Room, Consolidated Building, Fox Street, Johannesburg, immediately after the conclusion of the Annual General Meeting, which has been convened for 11.20 o'clock on the morning of the same day, and at the same place, for the purpose of considering, and if though fit of passing, the following Resolutions, namely :—

1. That the Directors be and they are hereby authorised, without prejudice to the powers of borrowing conferred on them by Clause 44 of the Articles of Association, to create and issue six thousand Debentures of Fifty pounds (£50) each, carrying interest at the rate of 5½ per cent. per annum and redeemable at par by twelve annual drawings, the first redemption to take place on the 1st July, 1915, and thereafter on the 1st July of each succeeding year until the whole of the Debentures are paid; and to be issued and secured in the terms laid down by a Trust Deed in the form of a draft submitted to this Meeting and identified by the signature of the Secretary of the Company and expressed to be made between the Company of the one part and the Johannesburg Consolidated Investment Company, Limited, of the other part, and that the Directors be and they are hereby authorised to execute a Deed in the terms of the said draft and to carry the same into effect, and to pass a Mortgage Bond in terms of the provisions of the said draft.
2. That the said Debentures shall in the first place be offered to the Shareholders of the Company registered as such on the 14th day of June, 1913, at the price of £49 for each £50 of Debentures, in terms of the draft Circular submitted to this Meeting and identified by the signature of the Secretary of the Company.
3. That the Directors be and they are hereby authorised to enter into an agreement in the form of the draft submitted to this Meeting and identified by the signature of the Secretary of the Company, and expressed to be entered into between the Company and the Johannesburg Consolidated Investment Company, Limited, whereby the Johannesburg Consolidated Investment Company, Limited, undertake, in consideration of the payment by the Company of a commission of 3 per cent. upon the nominal value of the Debenture issue, to take up and pay for, at the rate of £49 for each £50 of Debentures, all Debentures of the said issue which are not applied for and allotted to Shareholders of the Company in terms of the said Circular.

The draft Debenture Deed, draft Circular, and draft Agreement above referred to will lie for inspection of Shareholders at the Head Office of the Company, Consolidated Building, Johannesburg, during business hours, between the date of this notice and the date of the Meeting.

The firm of Barnato Bros., of which Mr. S. B. Joel, a Director of the Company, is a member, is interested with the Johannesburg Consolidated Investment Company, Limited, in the Agreement aforementioned.

By Order of the Board.

JOHANNESBURG CONSOLIDATED INVESTMENT CO., LTD., Secretaries.
per FRANK HALL.

Head Office: Consolidated Building
(P.O. Box 590), Johannesburg, 12th May, 1913.

has been engaged in the South African trade for the past half century. The vessel has been constructed under the superintendence of Mr. R. D. Richardson, assisted by Mr. Sheriff.

* * * *

Standard Bank.

In our last issue we dealt with the position of the National Bank; and a few words may here fittingly be said regarding the progress of the sister institution, the Standard Bank. The Bank is able to show a considerable increase in its figures. During the second half of last year the gross profit is returned at £486,471, as compared with £457,482 in the second half of 1911. After meeting all expenses and allowing £51,707 for rebate, the net profit is £158,920, to which has to be added £49,714 brought forward. The directors declare a dividend of 5s. per share and a bonus of 2s. per share, being together at the rate of 14 per cent. per annum; transfer £15,000 to bank premises, £10,000 to reserve, £15,000 to investment reserve, and £10,000 to pension fund, leaving £50,238 to be carried forward. A year ago the distribution was at the rate of 13 per cent. per annum, £20,000 was transferred to premises, £20,000 to reserve, and £10,000 to pension fund, whilst £47,637 was carried forward. The reserve fund now amounts to £1,980,000, as compared with a paid-up capital of £1,548,525. The figures in the balance sheet show considerable increases, deposit and current accounts being returned at £20,845,000, as compared with £19,142,000 at the end of 1911, while loans and discounts stand at £12,180,000, as against £11,865,000. This is largely the result of the energy displayed by the management in recent years in opening new offices, and the Standard is by far the most comprehensive of the banks working on the African Continent. A comparison of some of the leading figures is given below:—

	Dec. 31, 1911.	Dec. 31, 1912.
Gross profits	£457,482	£486,471
Net profits	156,149	158,920
Note circulation	1,165,471	1,177,291
Deposit and current accounts ...	19,142,065	20,845,263

* * * *

The Trade of Rhodesia.

The attention of those who have commercial interests in or relations with Rhodesia may be drawn to the issue of the report of the Controller of Customs for Southern Rhodesia for the year 1912, comprising the customary annual statements of imports and exports. There was a decrease of the importation of most articles of merchandise, but it was counterbalanced by the great increase in maize and railway material, the net increase in these importations over 1911 amounting to ·89 per cent. It is interesting to note that on the first time on record the value of South African products and manufactures imported into the territory exceeded the total value of the imports from all foreign countries combined. The forecast was given in the last previous annual report that probably the imports and exports for 1912 would not very appreciably exceed those for 1911. The following are the main totals: Imports, 1911, £2,975,112; 1912, £2,970,066. The average for the twelve years to December 31, 1911, was £1,723,438. Deducting railway and tramway material, Government imports, and specie, the net totals of ordinary merchandise imported were: 1911, £2,569,976; 1912, £2,447,952. The exports for 1912 were: South African produce, £2,975,100; railway and telegraph material, £728; other imported goods, £168,322; for other South African Governments, £7,631; specie, £30,217; total, £3,181,998. The corresponding total for 1911 was £3,098,400. Ordinary merchandise via Beira is now practically equal in value to that imported via Cape ports. The tonnage is greater, as most of the heavy goods are imported by the eastern route. With regard to the future, the report states that orders have been placed for large quantities of mining machinery, to be erected during 1913 and 1914, while maize is still being imported.

* * * *

African City Properties Trust.

The report of the African City Properties Trust, Ltd., for 1912, presented at the meeting on the 28th ult., states that the profit, including the balance from last year of £9,397, and after deducting all outgoings, amounts to £43,547. The directors now recommend a dividend of 5 per cent. on the ordinary shares, placing £5,000 to reserve account, and carrying forward £10,031. The company's properties are well let, the proportion of unoccupied premises being insignificant, while rents, especially of centrally situated properties, are well maintanied and have a tendency to increase.

Romola Nigel.

Shareholders in this company should note that application for the rights accruing to them in accordance with the special resolutions passed by the company on 21st April and 6th May, should be made on or before the 22nd of this month and their share holding registered in the books of the company by that date. The transfer register of the company will be closed from 23rd May to 15th June, 1913, both dates inclusive.

ANSWERS TO CORRESPONDENTS.

"Kroonstad."—Certainly hold on to your diamond shares.

"Anxious."—The annual report printed in our last issue gives you the desired information.

"G. D."—The prospectus is self-condemnatory, and the venture should be left alone.

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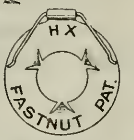

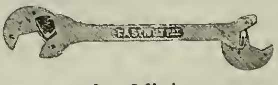

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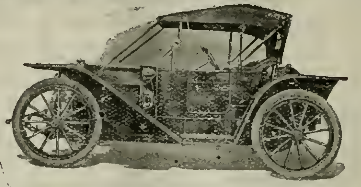

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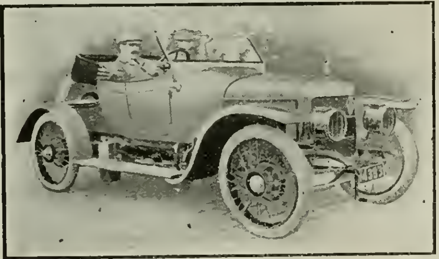

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Automobile Notes.

The age limit which the new Motor Act proposes to fix for motor drivers at the Cape is seventeen. During the recent proceedings of the Select Committee of the House of Commons on Motor Traffic, the suggestion was made that for the better safety of the public the age limit for a driver of a private motor vehicle in London should be twenty-one, and that no one under the age of twenty-five should be permitted to drive a public service conveyance. The idea that riper years ensure safety is a fallacy that will die hard, though the limit which it is proposed to set here errs, if anything, in favour of the youthful aspirant. A young man generally learns to drive much quicker than an elderly one, and makes his mistakes through over-confidence, whilst his senior, as frequently, falls into error through excessive carefulness, that at times gives the impression of timidity. One witness before the Committee suggested that it should be made a punishable offence for the driver of any vehicle to enter a main road from a side turning at a greater speed than four miles an hour. To fix arbitrary speed limits for certain points in the streets of a city is a futile way of attempting to deal with the traffic problem of to-day, when, as Sir Frederic de Waal pointed out in his speech at the banquet of the Royal Automobile Club of South Africa a fortnight ago, even the prescribed limit and less than the limit would, under certain conditions, be a dangerous speed. The only effective way of dealing with this problem is for the police to exercise the powers they already possess, and prosecute in every case of dangerous or reckless driving that may come under their observation, and the degree of danger will vary in the busy areas, from minute to minute, with the varying conditions of the traffic.

* * * *

The Tourist Trophy Race in the Isle of Man, projected by the R.A.C., is again in danger of falling through, owing to the action of the Society of Motor Manufacturers and Traders. The first proposal was, that the test should be a fuel test for low-priced cars of moderate power of a type to compete with the cheap American cars, now so much in evidence in the Old Country. To this proposal the S.M.M.T. objected, for the reason that, owing to the shortness of the notice, there would not be sufficient time in which to design and manufacture the required model. This was a reasonable objection, and was at once accepted by the R.A.C., which, rather than disappoint those who had been promised a race, thereupon cast about for some other basis on which it could be run. Ultimately, it was decided to hold a "stock car" race, and to this the S.M.M.T. appeared to give a tacit assent. Indeed, it is stated by the spokesmen of the Club that they had received the promise of the Society that it would not interfere in the race at all, but would leave its members free to do as they chose. It is now stated that the Society has informed its members that by entering they will be infringing the terms of the bond, and will, of course, incur the penalties therein provided. Among the objections to the conditions of the race urged by the trade, one is that it cannot be truly termed a stock car race, inasmuch as it bars cars listed in the makers' catalogues subsequent to February 17 last; another is to the engine dimension limit, which is set by the R.A.C. at 90 m.m. bore and 140 m.m. stroke. It is regrettable that the Technical Committee of the R.A.C. was not better informed as to the feelings of its trade members in regard to this event before issuing the conditions, as the unfortunate impression —to which expression has been freely given of late in the motoring Press—that the Club is unduly influenced by that section, is deepened, and colour is given to the accusation, when it is found that the conditions of its fixtures have to be modified to meet trade objections. It is to be hoped that the Club will not tamely abandon the race.

* * * *

The National Society of Chauffeurs is making preparation for carrying on a Parliamentary campaign, having for its object certain amendments to the Motor Car Act. It is sought to obtain: (1) The automatic cancellation of endorsements recorded upon motor driving licences (through the effluxion of time). (2) That only offences involving actual danger or injury to persons shall be endorsed upon motor driving licences. (3) That the owner of a car shall be responsible for all excesses of speed committed by his servant except in the event of: (a) the driver being the sole occupant of the car, or (b) the car being lent or hired, in which case the person under whose orders the chauffeur is driving shall be held responsible.

* * * *

The Divisional Council of George has given a useful lead in road improvement by passing the following resolution at its last meeting: "All private furrows crossing main and divisional roads in this district shall be bridged, piped or paved to the satisfaction of the Road Inspector of the Divisional Council, by, or at, the expense of the person or persons having the ownership or control of such furrow, and in future no furrow shall be constructed across any such road without the permission of the said Council. Provided that the Council may dispense with any of the above requirements in respect of the bridging, piping, or paving of private furrows in any case where the Council is satisfied that there are special circumstances in the nature of the furrow bed, or ground, rendering such bridging, piping or paving unnecessary. Any person, or persons, committing a breach of this regulation shall be liable, on conviction, to a penalty not exceeding £20 sterling, and, in addition thereto, any expenses incurred by the said Council in consequence of any breach of this regulation, or in the execution of any work directed by this regulation, to be executed by such person or persons committing such breach, or failing

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to execute such work." This is a good beginning, and it is hoped the Council will recognise the logical sequence, and in due time similarly reconstruct its own storm water furrows. It speaks eloquently of the rapidity with which the motor car is becoming part and parcel of our everyday life, when such conservative bodies as Divisional Councils acknowledge the objections to the mediæval custom of leading open water furrows across public roads, to which motorists are constantly drawing attention.

* * * *

Among recent accessories are to be found a new pattern Jones speedometer with an 8-day watch attachment which has a particularly neat and useful appearance, manufactured in brass or nickle; a C.A.V. hand mirror, illuminated with five small electric bulbs round the rim, for use in the car at night; the Ertee shock absorber—a combination of strong volute springs and pneumatic damper—displaying sound and strong workmanship, compactness and a distinctly pleasing appearance. The lubrication is carefully provided for, the shackle bolts being drilled and grooved, and provided with grease lubricators; the Javal Petrol Jet, a device for more perfectly atomising the fuel on its way to the mixing chamber, can be used in the place of any existing jet without alteration to the carburettor. It is claimed that it gives greater power, a saving of petrol and increased acceleration.

* * * *

The contractor of the motor post between George and Knysna has found it necessary to give notice for the termination of his contract. Technical troubles in connection with the cars, through a run of ill-luck, and an insufficient Government subsidy, are said to be the reasons for this decision.

* * * *

During the hearing of a case at the Bloomsbury County Court, Judge Bray said that there was not a driver in the country who had not exceeded the speed limit, and it was few who were caught.

The Industry in Statistics.

In the annual report of the Consolidated Mines Selection the following interesting statistics are given. There has been an increase of 5d. per ton in Rand working profit, viz., from 9s. 7d. for 1911 to 10s. in 1912, the total working profits for 1912 being £12,678,095—as compared with £11,415,861 during 1911—an improvement of over 11 per cent.

	Dec., 1911.	Dec., 1912.		
Number of stamps dropping .	9,565	9,440	Dec.	125
Number of tube mills working	241	277	Inc.	33
Average number of rock drills working	4,514	5,530	Inc.	1,016
Tons crushed per stamp per day	8.00	8.66	Inc.	.66
Tons hoisted per month per boy	12.83	13.12	Inc.	.29

The increased milling duty of ·66 tons per stamp per day is due to the larger proportion of tube mills to stamps now employed. An increase of 22½ per cent. in the number of rock drills working will also be noted. In this connection it is interesting to find that the number of rock drills operated by producing mines has advanced by 56 per cent. during the past two years. At the end of the year seven companies (all in the Far East Rand) had not reached the productive stage. Of these, the shafts of the Modder Deep Levels, Rand Klip, and the two northern shafts of the Modderfontein Government Areas intersected the reef during the year. The south-west shaft on Government Areas and the southern shaft on Springs Mines should reach the reef later in the year. Several new plants of large capacity were installed, giving proof that this method of treatment is now recognised as a permanency on the Rand. Precipitation by means of zinc dust, although not so widely adopted, may also be said to have gained in popularity. As development of the mines has expanded, and also as a consequence of reorganisation of enlarged properties, the tendency towards concentration in hoisting rock is becoming increasingly evident. Larger skips are now the rule, and more adequate station facilities for handling great quantities of ore have been introduced on many of the important properties. This concentration has involved the necessity for mechanical transport underground to bring ore from outlying sections of the mines to the winding shafts. Some irregularity has been experienced in the supply of electric power and air, and some stoppages have been caused thereby. It is understood, however, that duplicate generating machinery is rapidly coming forward, and it may be hoped that before long the mines will no longer be subject to the occasional losses involved by the present state of affairs.

Kolmanskop Diamonds

The output of diamonds from this company's property at Luderitzbucht for the month of April was 10,645 carats.

New Heriot.

The reports for the quarter ended the 31st March on operations at the New Heriot show that on development work 895 feet were driven, sunk, etc. From 33,430 tons milled the revenue recovered, including £1,885 from treatment of accumulated slimes, was £59,821. Working expenditure amounted to £35,577, or 21s. 3·416d. per ton milled, which left a profit of £24,244, or 14s. 6·05d. per ton. In January the mill engine was stopped from the 18th to the 21st for repairs, which were duly effected.

INVESTORS' DIARY.

The following company meetings have been announced:—

May 21.—Apex Mines; New Kleinfontein.
May 23.—Knight Central; Cloverfield Mines.
May 27—Transvaal Coal Trust; Brakpan Mines; Springs Mines; New Era Consolidated.
May 28—Tudor G.M.; Van Dyk Prop.; Princess Estate; Lancaster West; May Consolidated; Geduld Prop. Mines; Modderfontein Deep Levels; New Rietfontein; Ginsberg; New Primrose; Consolidated Langlaagte; Witwatersrand G.M. Co.; New Unified; Van Ryn Deep; Government Areas; Glencairn.
May 29.—Roodepoort United; West Rand Consolidated; Meyer and Charlton; New Goch.
May 30.—Sacke Estates; Aurora West; Cinderella Consolidated; Nev Steyn Estate; Rand Collieries.
June 3.—Moderfontein B.; Robinson.
June 4.—Rose Deep; Village Deep
June 5. Durban Roodepoort Deep; City Deep.
June 6.—Bantjes Consolidated; Geldenhuis Deep; Crown Mines.
June 17.—Transvaal Consolidated Lands.
June 18.—Rand Mines.
June 27.—A. Goerz and Co.

Romola Nigel Gold Mining Company, Ltd.

Notification is hereby given to Shareholders in the abovenamed Company that application for the rights accruing to them in accordance with the Special Resolutions passed by the Company on 21st April and 6th May, should be made on or before the 22nd of this month and their share holding registered in the books of the Company by that date. The Transfer Register of the Company will be closed from 23rd May to 15th June, 1913, both dates inclusive.

By Order of the Board of Directors,
A. RANDELL,
Secretary,
ROMOLA NIGEL GOLD MINING COMPANY, LTD.,
148/51, Exploration Buildings, Johannesburg.
P.O. Box 3308,
Johannesburg.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

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IMPORTANT NOTICE.

NOTICE IS HEREBY GIVEN THAT THE LONDON OFFICE OF THIS JOURNAL, IN SALISBURY HOUSE, HAS BEEN CLOSED. THE ENGLISH AGENCY OF THE PAPER HAS BEEN ENTRUSTED TO THE ARGUS PRINTING AND PUBLISHING COMPANY, LIMITED, BYRON HOUSE, 82-85, FLEET STREET, LONDON, E.C. OVERSEA ADVERTISERS AND SUBSCRIBERS ARE KINDLY REQUESTED TO PAY THEIR ACCOUNTS AND SUBSCRIPTIONS TO THE ARGUS COMPANY. WHO WILL GRANT RECEIPTS ON OUR BEHALF. PAYMENTS MADE TO ANY OTHER PERSON OR PERSONS WILL NOT BE RECOGNISED.

THE LOCAL OFFICES OF THE JOURNAL ARE BEING REMOVED NEXT WEEK TO 176-180, NEW STOCK EXCHANGE BUILDINGS.

Notes and News.

Government Areas. On Thursday an official intimation was received from the Government Gold Mining Areas that the reef had been struck in the south-east shaft at a depth of 3,560 feet. The reef is five feet thick and the assays may be known by the time this appears in print.

* * * *

Wit. Deep Prospects. The Wit. Deep has had an excellent year: development throughout the mine is satisfactory, and the Chairman, at the annual meeting held last week, was able to hold out the promise of bigger dividends. This is one of the most successful of the Neumann mines, and has been very well handled from the start. A full report of Mr. Gill's speech at the meeting will be found elsewhere in this issue.

* * * *

Vogel Deep, Rietkuil and Marievale Nigel. Annual meetings of the Vogel Deep, Rietkuil and Marievale Nigel companies were held last week, and shareholders informed that their properties were still in the safe keeping of a caretaker. The debenture holders in the case of the Vogel Deep are content to await better times, and the shareholders in the other two companies have no other option.

* * * *

Rex Zaaiplaats. The Rex Zaaiplaats Tin Company has been refloated in London with a capital of £30,000. The former company had a capital of £22,000, in 5s. shares, of which £9,000 was working capital and reserve. The property consists of 58 claims on the farm Zaaiplaats, to the north of the mine of that name. The work already done on the property has given good indications, and with the further working capital now provided, satisfactory results are anticipated.

Red Cross Society.

At a meeting held on Wednesday, under the presidency of Mr. W. Cullen, it was decided to form a Red Cross Association. The following provisional executive committee was formed: Messrs. W. Cullen, N. F. Swinburne (Acting Government Mining Engineer), Prof. Wilkinson, Major Jones (Defence Force), Messrs. A. D. Maxwell (Transvaal Miners' Association), T. A. Forrest (E.R.P.M.), C. T. W. Burbury, A. F. Williams (De Beers), C. H. Acheson, Mrs. Kantorowitz (Women's Reform Club), and Dr. S. van Niekerk, Dr. H. B. Currie, Dr. G. A. Murray, Dr. Ritchie Thomson, Dr. Temple Mursell, and Mr. Fred. Rowland, hon. secretary pro tem.

* * * *

Refractory Ores and a New Process

Some interesting metallurgical work is being carried out locally by a concern styled the "Refractory Ores, Ltd." The results obtained by usage of an electrolytic process on refractory ores have been exceptionally encouraging, so much so that a leading mining house has lent encouragement to the syndicate's researches and experiments. The method of treatment adopted is simple in the extreme, and it is not claimed for it that it does more than remove the deleterious elements in an ore and so render it amenable to treatment by ordinary cyanidation. The process has the distinct merit of being a continuous one, and the cost, apart from consumption of electrical current, is infinitesimal. As it is an expenditure of two shillings per ton is estimated to cover the cost of everything included in the scope of the treatment, and it is claimed that an ore from a certain mine in the Barberton District, which could not, under ordinary methods, be made to yield an extraction of more than 33 per cent., by means of the "Refractory Ores" process has given the high recovery of 96 per cent. The results of further tests will be awaited with interest.

* * * *

New Transvaal Gold Farms.

A dividend of 10 per cent., or 3d. per share, has been declared by the New Transvaal Gold Farms, Limited. It will be remembered that 17s. 6d. per share was written off the nominal value of these shares last year. It is understood that the value of the assets held by this company have appreciated of late, owing to the general rise in the value of land.

* * * *

Encouraging Oil Prospecting.

It is officially notified that Government has arranged for investigations into occurrences of mineral oil indications within the Union. Persons who have reason to believe that indications of oil exist in any locality are invited to communicate with the Under Secretary of Mines, Pretoria, giving full particulars of the nature of the occurrence and indications of the locality, tenure of land, and best means of access thereto. The official notice gives no further details, but it is clear that the Government is anxious to encourage prospecting for oil in the Union. The offer of a substantial bonus, similar to that which the New Zealand Government offered for gold finds, might prove the most effective stimulus to the industry.

* * * *

Misleading Calculations.

Misleading figures, like lies, once started, are difficult to overtake. Last Saturday Mr. D. Christopherson, joint manager of the Consolidated Gold Fields, wrote to the newspapers traversing the statements made in the House of Assembly and elsewhere in regard to deaths among tropical natives. He says that in March, 1,507 natives were detained in the W.N.L.A. compound for acclimatisation purposes, and stayed an average of 22 days, and of that number, mainly owing to an outbreak of pneumonia, 88 died. The Minister of Native Affairs stated that the death-rate resulting from those 88 deaths was at the rate of 229 per thousand per annum, which was expressing the death-rate of a continually changing population in similar terms to the death-rate of an ordinary stationary population. This, Mr. Christopherson points out, was misleading. The proper method to express, arithmetically, deaths among tropical natives in the detention compound is to state that out of so many natives passing through, so many died during the period of detention, and then express these figures in terms of per thousand passing through. Calculating in this way, he reckons that 88 deaths out of 4,597 natives gives a death-rate of 19 per thousand passing through. On behalf of the group he represents, Mr. Christopherson wishes to contradict the impression that one-quarter of the boys passing through the detention compound died before allotment to mines.

* * * *

Apex Outlook.

The greater part of Col. Dalrymple's speech at the annual meeting of the Apex Company this week was devoted to reviewing the report and accounts for 1912. In regard to the vexed question of financing the gold section, it appears from the chairman's speech that the directors have not in any way relaxed their efforts to formulate a scheme which would be acceptable to both companies, and also satisfy the principal creditors of the Benoni Company, and at the same time carry with it a guarantee which is so essential for the success of any such issue, more particularly in times when shareholders as a whole in mining ventures show no great desire to give material financial support. During the year further propositions were discussed by the Board and probable guarantors, and in connection therewith the consulting engineer went to London in the month of August to advise on the technical matters at issue, and unanimity from this standpoint was eventually arrived at.

> "Had times been propitious for such schemes," added Colonel Dalrymple, "there is every probability that the necessary financial guarantee would have been obtained and a definite proposal placed before shareholders towards the end of the year. However, the possibility of a rupture between the great Powers over the Balkan war, and the consequent political and financial crisis which has been hanging over Europe for so long, led to extreme tightness of money, and has up to date rendered it quite impossible to carry through any reasonable scheme. The feeling in Europe has lately become less strained, and I think that we may hope the war clouds are passing away, and that the remaining difficulties will be overcome by diplomacy and gradually permit of a restoration of normal financial conditions. In the meantime, I wish to assure shareholders that they may rely upon the directors taking the very earliest opportunity of getting the company financed."

* * * *

New Kleinfontein Position.

The speech made by Col. Dalrymple at the annual meeting of the New Kleinfontein this week will be welcomed by shareholders as putting an end to the many vague rumours recently circulated in regard to the life of the mine. We reproduce his remarks on the subject elsewhere in this issue, from which it will be seen that no attempt was made to burke discussion on this vital question and the reason for the recent rumours regarding it.

* * * *

Doings of the Collieries.

The statistics issued by the Mines Department of the Union of South Africa for April contain as usual a wealth of data and information bearing on the several branches of the mineral industry in the sub-continent, but as the bulk of the figures relating to gold output, labour, etc., has already been dealt with in this journal, we refrain from quoting from the comprehensive documents before us at great length. In regard to coal it may be observed that the output for the Union in April was 763,620 tons of a value at pit's mouth of £191,513, as against 713,781 tons worth £178,703 in March. Each Province records an increase in production over that of the preceding month. Figures for the different Provinces are as under:—

	No. of Collieries	Total Coal Sold. Tons.	Total Value realised at Pit's Mouth.	Value per Ton at Pit's Mouth	
				s.	d.
Transvaal	30	146,740	£95,854	4	3.50
Cape	9	6,464	3,583	11	1.22
Orange Free State	5	50,370	14,188	5	7.60
Natal	22	260,046	77,188	5	11.88
Union of S.A. ...	66	763,620	£191,513	—	

In the Transvaal, 340,752 tons, worth £72,408, were won from the Middelburg area.

Tin and Copper Outputs.

The output of copper in South Africa last month was 1,127 tons, of which the Namaqualand mines produced 1,183 tons of 17·47 per cent. metal value and the Transvaal 241 tons of 52·18 per cent. metal contents. No ore was shipped from the Cape, but from the Messina Mine, in the Northern Transvaal, 168·5 tons, worth £12,601, were despatched, as compared with a shipment of 100 tons, value £11,133, in March. The total output of cassiterite was 282 tons. Of this the mines in the Waterberg district of the Transvaal Province produced 274 tons, containing 69·21 per cent. of metal and the Cape returned 8 tons of 70 per cent. value. No tin was shipped by the Cape, but from the Transvaal 213 tons, of a value of £31,594, were despatched, as compared with 319 tons, worth £11,530, in March.

* * * *

An Increase in Development.

Last month witnessed a marked increase in development on Transvaal gold mines. On the Rand 17,140 feet of main drives and cross-cuts were driven, 2,830 feet of shaft sinking, and 28,726 feet of other development. For the whole Transvaal the development figures for the first four months of this year compare as under:—

Development.

Main Drives and Cross Cuts. Feet.	Main Shaft Sinking. Feet.	Other Development. Feet.	Average No. of Rock Drills in use.
48,108	3,576	26,572	5,610
50,931	3,457	27,615	5,614
50,182	2,976	26,555	5,845
48,136	2,606	25,367	5,717
52,557	3,281	27,391	6,178
47,398	2,429	26,555	6,057
52,821	2,790	28,347	6,204
56,186	3,256	30,356	6,190

* * * *

Shares for Sale and Wanted.

In regard to our intention to print a list of shares for sale and wanted, a reader writes from Senekal, O.F.S.: Regarding your editorial remarks with reference to opening your columns to advertisements of shares for sale and wanted, I should be extremely glad if you did this, and I am sure it would enormously increase your sales.

* * * *

Central Mining Figures.

From the report of Mr. Hugh F. Marriot, consulting engineer of the Central Mining Corporation, Ltd., it appears that in 1912 the average yield of the tonnage milled for this group of mines was 33·6s., the extraction being 95·6 per cent., and the original value 35·14s. per ton. The working cost was 20·6s., and the net profit, after deducting profit tax, 11·7s. per ton. The grade of the ore reserves is estimated at 30·8s., which by sorting at the average rate, 14·08 per cent., is raised to 35·2s., corresponding very closely with the grade milled during the year. As compared with 1911 the yield of the ore is higher by 0·63s., the working expenses higher by 0·49s., and the working profit higher by 0·15s. per ton. The rise in the costs in the face of constant effort at saving by improved organisation and equipment is an unpleasant feature. Native wages and the cost of recruiting have advanced, and, in addition, the recent legislation of the South African Government with regard to the eight hours' day underground, the compensation for miners' phthisis, and the provision of spraying equipment has imposed a rather heavy burden on the industry. Quite recently the manager of the Crown Mines, in the course of an address to the South African Engineers, pointed out that whereas the costs were now 18s. 3·6d., or 1s. 4d. per ton higher than at the date of the amalgamation, they would be 13s. 1·7d., or almost 3s. 10d. per ton lower than at that date if the conditions now were the same as then. The directors express themselves as quite satisfied with the results so far obtained from the combined action of the groups in the matter of recruiting, and say that material benefits are to be expected in the reduction of recruiting expenses, but the best that can be expected of the Legislature is that it will refrain for a time from imposing new burdens.

TOPICS OF THE WEEK.

THE E.R.P.M. MEETING.

SIR GEORGE FARRAR'S speech from the chair at the E.R.P.M. meeting on Wednesday followed the beaten track. In accordance with the usual practice, he elaborated and explained the annual reports, the contents of which have been familiar to shareholders for some time; he supplemented those reports by details of development results down to date, and he firmly refused to indulge in any forecasts regarding the future of the property. If the speech was colourless and none too encouraging to that extent, it certainly must have disappointed the pessimists, who have for months back been spreading rumours of changes in the directorate and management of the mine. We gather from Sir George Farrar's speech that no such changes are pending and that all concerned are making a big whole-hearted effort to advance the fortunes of the E.R.P.M. Taking the speech from the chair in the order of the three divisions already indicated, it will be seen that at the end of 1912 the cash position was sound and improving, the ore reserves below those of 1911, but the mining position, on the whole, healthier. Owing to the contractors' delay the pumping plant for the western section is still undelivered, and may be delayed till late this year. Its advent, in the light of the better results from the Wit. Deep below the dyke, promises well for the opening up of the western or Driefontein section of the property. Turning to the latest development results, it will be seen that they are moderately satisfactory, though in no way conclusive. Generally speaking the development exposures for the four months of the present year are on a par with those obtained for 1912. The results from the Hercules shaft are still meagre and the work done inadequate to prove anything. In the Comet, Angelo and Cason sections there is an improvement in recent exposures, and the Driefontein is, of course, still awaiting the pumping plant. Sir George's statement of policy reflects the transition stage through which the company is still passing. Naturally he has to be cautious in giving an expression of opinion as to the future of the company and the dividends that may be expected. Sir George reminded his hearers that to anyone who has any idea of the vicissitudes of mining, it must be patent that to prophesy any further than one can see would be most unwise. Speaking, however, on behalf of his co-directors, he said they intended to continue a policy of caution, maintaining the corporation in a strong financial position, and, later, when enabled to see the results of more extensive development operations, especially in the western section of the property, to take stock of the position and shape future policy accordingly. In the circumstances, no one can quarrel with this frank admission of a policy of "wait and see." Long-winded prophecies and meaningless, if not actually misinforming, forecasts have had their day at Rand company meetings; and the E.R.P.M. people are wiser to eschew prophecy altogether, even if they lay themselves open to a charge of little faith. There are people, of course, who will always read doubt into an optimistic speech and disaster into a cautious utterance like that of Sir George Farrar's on Wednesday. If they read more into the words than they convey, they can only blame themselves if, as shareholders, they are scared out of their holdings, or if as advisers of others they cause loss to the latter. We believe that the lessons of last year have caused the E.R.P.M. people to be ultra-conservative in their forecasts, and prevented the chairman from needlessly committing himself to anything that remains unproved. In that belief, all concerned can be congratulated on the successful negotiation of a very trying year and the frank and courageous publication of all the material facts available in regard to the present and future of the property.

TRAINING ENGINEERS IN SOUTH AFRICA.

Much has been written on the training of engineers in this country, but it is a subject of such great importance that our scientific societies cannot be blamed for so often returning to it. At recent meetings of the Chemical, Metallurgical and Mining Society and the South African Institute of Electrical Engineers notable contributions were made to the subject, which, even if not strikingly original, cannot be allowed to pass unnoticed. Four years ago Professor Orr, of the Transvaal University College, in a valuable paper read before the Transvaal Institution of Mechanical Engineers, dealt with "The Education and Training of Engineers and Artizans with Special Reference to Africa." The subject was under discussion before that body for over a year. A special committee of the Institute sat for a considerable time, and a great advance was made in the cause of technical education by the adoption of the "Sandwich" system at the S.A. School of Mines and Technology, then known as the Transvaal University College. During the past year the subject was revived by Mr. Wm. Cullen, who read a paper before the S.A. Institution of Engineers entitled "Trade Schools and Continuation Classes," and by Mr. F. C. Pooler, who read a paper on "The Surface Workers on the Rand and Their Technical Education," before the Chemical, Metallurgical and Mining Society of South Africa. These papers have given rise to lively discussion, and only last Saturday night, Mr. Cullen replied in a masterly review of the whole situation, with special emphasis on the need of facing native competition. The South African Institute of Electrical Engineers has likewise started seriously to consider the question, and a paper read a little while ago by Mr. Norman Harrison, the chief engineer of the Post Office, though marred by incompleteness, served to set the ball again rolling. At the March meeting of the Institute Professor Orr took Mr. Harrison severely to task for the omissions in his paper, and joined issue in regard to what had been done for the training of engineers in this country.

"It is indeed unfortunate," said Professor Orr, "that the author, before reading this paper, did not take steps to make himself acquainted with what is being done and what has been done in South Africa. Since the foundation of the South African School of Mines in 1896, many engineers have been trained who have already made their mark in this country. I realise that the author lays stress on commercial training, but he is aware that, roughly, 25 per cent. of the mine managerships on the Rand are held by South African graduates, positions which we all know call for a considerable commercial and financial knowledge as well as organising and technical ability? In view of all that has been said and written about technical education in South Africa, in view of the hundreds of South Africans who have been trained in the engineering profession, in view of the existence of two flourishing technical colleges in South Africa—the day class calendar of the S.A. School of Mines and Technology runs into 374 pages and the evening class prospectus to 303 pages—in view of the fact that placards announcing the various diploma courses in the Institution in which this meeting is being held have been exhibited at practically every railway station in South Africa, in view of the fact that the Union Government voted last year to the local Technical Institution a sum in the neighbourhood of £15,000, and in view of the presence of nearly 1,500 evening class students, it is with a feeling of great self-effacement that I read in the author's paper: 'With regard to South Africa, it is a very difficult matter to find out what has been done to provide engineers, as the educational authorities have not taken any action generally, and any steps that have been taken have been more of an individual character and not for the general good!'"

Professor Orr had little difficulty in disposing of the rest of Mr. Harrison's criticisms. At the same meeting Professor J. H. Dobson read a long and interesting contribution to the subject. His recommendations may be summarized as follows:—(1) Gradual raising of the standard of general education and matriculation examination. (2) Assuming that (1) is attained, introduction of commercial and economic subjects into engineering courses. (3) Increase in the staff of existing institutions (S.A. School of Mines and Technology, and S.A. College Engineering School). (4) More adequate equipment for these institutions. (5) Greater facilities for practical training. (6) Recognition of properly trained South African engineers by Government and South African undertakings. Plainly, authorities are not agreed as to whether enough has yet been done in this important direction.

GOLD PRODUCTION AND PRICES.

The fallacy involved in the popular belief that the increasing production of gold is responsible for the higher cost of living and kindred evils has been exposed of late by several leading economists. Mr. E. M. Weston, A.S.M.B. of the South African School of Mines, in a paper read recently before the Chemical, Metallurgical and Mining Society, reviewed the whole fascinating question, and quoted many well-known authorities in support of his views that the theory is both untrue and untenable. Were it otherwise, those responsible for the increasing output of the Rand would, of course, be adding to world's troubles by augmenting the stock of gold. The increase in the world's foreign trade has been 7 per cent. per annum since 1895, and the increase of gold output has been less than 2 per cent., and yet prices have risen. Gold is scarce and threatens to become scarcer. Mr. Weston is a confirmed pessimist regarding the future progress of civilization. Except in regard to iron and coal the next generation, he thinks, must experience a shortage of the industrial metals despite any rise in prices. The world has now been well raked over, and with the exception of a few very remote regions, its resources are now fairly well known, and have been extensively exploited. There is no lead producing district that can surely keep up its production for fifteen years, and very few copper producing districts that can do the same for twenty-five years. A decade should show a large reduction of output in nearly all zinc producing districts. With almost only one single exception the gold and silver producing districts of the world can be shown to have reached their maximum outputs. With the Witwatersrand Mr. Weston groups the Alaska Treadwell, the Black Hills and the new Porcupine fields as possible exceptions. A number of important goldfields are showing more or less rapid declines—or, like the Mysore mines, have reached such depth that the future cannot eclipse the past. The output of Australia, U.S.A., Mexico and Russia declines and that of other producing countries show but slight increases except the Witwatersrand. The only undeveloped field that can give any hope of supplying the world's future needs is on the East Rand though we have not yet enough information to estimate the proportion of payable ground that will be met with there. The Far East Rand, says Mr. Weston, will soon be one of the most important places on the globe; as on the other portions of the field, it will, in a few years, take the deep mines all they can do to compensate for the exhaustion of the outcrops. One scarcely cares to guess at what may happen as the world continues to expand and the increase of Rand production is swallowed up by declines in other countries. Increase of demand must tend to raise prices, and shortage of gold to create financial panics. How these factors will work out it is impossible to predict. Can the world escape a huge reduction in credit and a period of depression and reorganisation? Within a decade bimetallism may again be talked about. One might dream of a future gold trust which demanded £6 per oz. for the world's gold production, or some other state of affairs that seems impossible to-day. The development of the East Rand is rather behindhand to-day, and there is much new development work suspended for want of funds. The moral of it all, according to Mr. Weston, is that the mine magnates are not sinister figures engaged in flooding Europe with gold and ruining honest people by raising prices. On the contrary, they are to-day doing the most necessary work for civilisation as at present constituted, and on the success of their efforts to attract capital to make available the latent gold resources of the Rand, depends the stability of credit conditions over the whole civilised world.

THE RAND'S ORE RESERVES.

One Hundred and Ten Million Tons of Profitable Ore Developed—Figures for Groups and Individual Mines—Reserves Four Years Ahead of the Mills—£150,000,000 in Gold Awaiting Removal.

We give hereunder our usual annual table of Rand ore reserves. The figures given below reflect the position in regard to ore developed as at December 31st, 1912. Where figures at this date are not available, the statistics are culled from the last annual reports published. Some weeks ago we dealt with the Rand's ore reserves and contrasted the tonnages and values at the end of 1912 with those declared in respect of the end of 1911. At that time, however, we were unable to give a full and complete list, as certain important companies had not then issued their reports. We are now enabled to give a complete, or practically complete, list, the one or two omissions noticeable are unimportant. In the cases of some mines tonnages are segregated according to value.

ORE RESERVES OF THE GROUPS.

The tables given herewith classify the ore reserves of the mines according to the various controlling houses or groups, and deal with only "payable," fully exposed, and fully valued tonnages, except in one or two special instances. The group aggregates are as under:—

Group.	No. of Mines.	Tons.
Central Mining & Investment Corporation	15	38,563,916
Consolidated Gold Fields of S. Africa ...	5	8,655,403
East Rand Proprietary Mines	1	6,013,000
Anglo-French Exploration Company ...	1	1,687,101
Consolidated Mines Selection	1	2,457,000
Randfontein-Langlaagte	2	8,970,639
General Mining and Finance Corporation	7	6,808,889
Johannesburg Consolidated Invest. Co....	8	6,740,909
S. Neumann & Co.	5	4,268,634
A. Goerz & Co.	4	2,721,500
Independent Company	1	500,471
	50	87,387,462

Group totals at the end of 1911 were:—

	Tons.
Central Mining and Investment Corporation ...	38,358,242
Consolidated Gold Fields of South Africa ...	9,199,000
East Rand Proprietary Mines	6,716,605
Anglo-French Group	1,753,370
General Mining and Finance Corporation ...	5,842,556
S. Neumann & Co.	4,183,962
Johannesburg Consolidated Investment Co. ...	5,814,231
Randfontein-Langlaagte Group	6,940,166
A. Goerz & Co.	1,949,207
Consolidated Mines Selection	1,925,346
Total	82,682,685

The grand total arrived at for the end of last year is, it will be observed, 87,387,462 tons, or getting on for five million tons in advance of the 1911 estimate. If to this total of eighty-seven and a-third million tons be added ore partially developed or partially valued, the great bulk of which may be assumed to be "payable," and there be also added the tonnages of pay rock awaiting mining in a few comparatively unimportant mines not included in the above, a grand total of about one hundred and ten million tons is arrived at.

FEATURES OF THE YEAR'S WORK.

A small increase is to be observed in the aggregate tonnage blocked out, but nothing very significant or important. Neither is any appreciable difference to be observed in the assay value. During the past twelve months the mines have continued to be engaged in bettering underground working conditions and meeting the continued shortage of native labour by strenuous endeavours to substitute mechanical appliances wherever possible, rather than in advancing development to any remarkable degree, except at certain propositions. The existing legislation does not encourage companies to advance development very much ahead of the mill. It may also be remarked that the majority of Witwatersrand mines are now in a strong position with regard to ore reserves, and, taking the aggregate reserve for the whole Rand at one hundred and ten million tons on mixed milling and mining bases of estimation, and the annual rate of crushing at twenty-seven million tons, the ore blocked out is four years or more ahead of the combined batteries. During the past year some companies largely increased their tonnages in reserve, notably one or two mines under the control of the Johannesburg Consolidated Investment Co. On the other hand, some companies, through encountering poor zones, show a decline. The influence of working costs must here have to be taken into account—the raising of the pay limit consequent on higher working expenditure meaning a decrease in reserve, and *vice versa* a lowering in that factor (as a result of decreased costs) an increase in the total.

A VAST HOARD OF GOLD.

We do not propose to hazard any hard-and-fast figures as to what this vast tonnage of ore—this enormous stock-in-trade of the industry—may mean to shareholders in dividends, or to the country in working costs. Obviously the accumulation of such a colossal tonnage of profitable ore ready for stoping makes for industrial stability. Even so, the Rand is still largely at the mercy of legislation, labour difficulties, and a thousand and one other factors. It is, in fact, at the caprice of the Government and the "coloured gentleman" to a degree which deters us from venturing predictions as to the ultimate dividend value of the one hundred and ten million tons above arrived at. We may, however, with some degree of confidence, advance the estimate that this tonnage contains gold of a total recoverable value amounting to about £150,000,000. In the above calculations no account has been taken of the many millions of tons of low-grade ore—the accumulations of years of exploitation—which are standing developed in the mines. Much of this low-grade ore is verging on the profit line. It needs but a happy swing of the pendulum of the industrial clock to transfer several millions of tons from the unprofitable to the profitable side of the Rand's ledger. The complete list is as follows:—

CENTRAL MINING AND INVESTMENT.

Bantjes Consolidated ...	840,890	7·0
City Deep	1,914,540	8·7
	209,110	8·6
City and Suburban	773,300	8·4
Crown Mines	10,607,670	7·1
Durban Roodepoort Deep	965,300	6·7
	340,800	7·3
Ferreira Deep	2,070,900	9·4
Geldenhuis Deep	1,904,700	6·3
Modder B.	2,594,000	7·2
New Heriot	590,742	8·1
New Modder	3,900,000	8·1
Nourse Mines	1,969,000	6·6
Robinson	1,130,600	11·0
	242,500*	
	1,160,800†	4·3
Rose Deep	3,695,400	6·4
Village Deep	2,235,300	6·9
Village Main Reef	1,118,751	8·8
	38,563,916	

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* Old workings, stope and shaft pillars, etc. † Main Reef.

Consolidated Gold Fields of South Africa.

Jupiter	1,270,000	4·1
	101,000	4·0
Knights Deep	1,477,414	4·47
Robinson Deep	1,114,000	6·7
Simmer and Jack	2,680,000	6·2
	438,000	5·3
Simmer Deep	1,130,693	4·2
	144,296	4·08
	8,655,403	

E.R.P.M.

East Rand Proprietary ...	6,013,000	6·8

Anglo-French Exploration Company.

Apex	196,138	6·18
New Kleinfontein	1,190,663	7·59
	1,687,101	

Consolidated Mines Selection.

Brakpan Mines	2,457,000	6·71

General Mining and Finance Corporation.

Aurora West	556,163	5·1
Cinderella Consolidated ...	573,000	6·7
	304,000	
Meyer and Charlton	341,745	12·0
New Goch	957,600	5·1
Roodepoort United	379,283	5·08
	100,000	6·34
Van Ryn	2,064,500	6·42
	89,365	5·24
West Rand Consolidated ...	1,116,733	6·02
	326,500	
	6,808,889	

Randfontein-Langlaagte.

Langlaagte Estate	1,370,639	
Randfontein Central ...	7,600,000	6·2
	8,970,639	

Johannesburg Consolidated Investment Company.

Consolidated Langlaagte .	2,069,630	6·4
Ginsberg	346,684	6·9
Glencairn	761,000	3·5
New Primrose	413,033	6·5
New Rietfontein	135,887	6·5
	130,107	
New Unified	275,028	6·4
Witwatersrand	1,331,540	6·1
Van Ryn Deep	1,278,003	7·1
	6,740,909	

S. Neumann & Co.

Consolidated Main Reef ...	610,680	7·2
Main Reef West	685,720	6·3
Knights Central	647,000	6·1
Wit. Deep	1,492,257	6·83
Wolhuter	832,977	6·48
	4,268,634	

A. Goerz & Co.

Geduld Proprietary ...	1,475,000	6·98
	116,000	5·79
Lancaster West	335,500	6·1
May Consolidated	133,000	6·64
	25,000	8·49*
Princess Estate	637,000	7·24
	2,721,500	

Independent Company.

Luipaardsvlei Estate ...	500,471	5·7

ZAMBEZIA'S MINERAL WEALTH.

A Portuguese View—A Development Company and Its Proposals.

The quaint old world township of Tete, which is situated on the Zambesi River, has tor centuries been the centre of a mining district ot some importance. It has, however, never produced very much (not during modern times, at any rate) and, indeed, were it not for the periodical issue of glowing reports by the Companhia da Zambezia and occasional optimistic reviews in the Portuguese Press, this district would be in danger of sinking into oblivion as far as its reputation as a mining field is concerned. In the *Mozambique Gazette* for May there appears a lengthy article entitled "The Riches of Tete." The article deals mainly with statements made by Lieut. Pinto Leal, the Secretary of the Mining Department of the Zambezia Company.

"Lieutenant Pinto Leal," remarks our contemporary, "is very enthusiastic regarding the territory, its prospects, and the future of the Zambezia Company; in fact, he declared that we living in the southern portion of the Province could form no idea of the vast richness of the Province, that we would require to go north to see the vast richness of the Province. Speaking of the territory of the Zambezia Company, he informed us that it covered nearly the whole area of the districts of Quelimane and Tete, in which the company was hard at work developing its mineral, agricultural, and industrial resources. Speaking specially of the mining industry and mining prospects generally, he said the country is almost of unexampled richness in mineral deposits, from gold to coal, lying ready to man's hand for profitable exploitation. He entertains no doubt there is a grand future before the country through the utilisation of this mineral wealth. But before that can be done properly the whole region must be made better known and peopled, and rendered more accessible, whilst old methods must be abandoned and prevailing lethargy removed. A fair amount of prospecting, he said, and development work is now being engaged in. The country, however, is so vast that several thousands of prospectors and miners should be able to settle throughout its wide extent without incommodating each other. The copper mines of Snr. Bivar and Trigoso have, he says, flattering results, whilst at Chifumbase gold is already beginning to be treated in quantity. The results so far have been most hopeful, and are of good augury for the future great importance of the mining industry in this region. Through the energetic and patriotic efforts of Snr. Portugal Durao, the director of the company, a company has been formed named the Zambezia Mining Development Company. The objects of this company are two-fold—to develop the territory and to act as a mining bank in assisting the mining industry. The company is prepared to spend, during a period of fourteen years, the sum of £1,400,000. The resident director is Mr. Bernard Smol, and, he said, though his report has not yet been made public, Mr. Smol seems very hopeful and keen on the possibilities of the territory. The company is an English one, having its head office in Paris. The company has secured the services of a specialist in alluvial mining, Mr. Bovée, who has been prospecting on its behalf on the banks of the Luanha and Mazóe rivers, but, owing to the fact that the prospecting material arrived too late for this season, nothing definite has yet been done. He is at present in Europe, and will return at the end of the year."

The article in question contains one or two curious statements. There is one in particular which we are at a loss to understand. In regard to coal it is stated: "The learned Dr. Livingstone, who recently visited Tete and the surrounding country on his journey to Angola by way of the interior, met with seams of coal on the margin of the river Revubue, two miles from town, and also at Chicova and other places." The visit of Dr. Livingstone can hardly be described as recent!

The Metlapetsi Alluvial, Ltd., has gone into voluntary liquidation.

THE "BOOM" IN DIAMOND MINING.

Widespread Prospecting—Resuscitation Under Powerful Auspices—What is a Mine?

The element of speculation which has for so long been dead, or at least dormant, on the Johannesburg share market has been revivified by the stimulating influences of diamond syndicate flotation and resuscitation. Most people will welcome some evidence of animation on the long stagnant Stock Exchange. Brokers at any rate most certainly will, and it is to be presumed that the host of minor syndicate promoters who have had such lean years of it recently will not be averse from making the best of such opportunities as present themselves in the direction of the prevailing fashion in mining. For in mining, as in many other things, that subtle influence which is called fashion plays an important part. Those who care to review the history of speculation in Johannesburg since the war will see that the various booms and boomlets may be sharply divided according as to whether they were concerned with diamonds or tin or alluvial gold. At one time Madagascar was all the rage. At another there was a rush for prospects in the Boshof district. In one eventful year the line of country lying to the south-east of Heidelberg absorbed attention and savings. And now Johannesburg appears to have returned to one of its former loves, and all over the sub-continent prospecting for diamonds is being vigorously prosecuted; abandoned properties are being resuscitated and new concerns are coming to light.

Speculation, Healthy and Otherwise.

Healthy speculation is to be encouraged rather than discouraged. Diamond mining is perhaps more of a gamble than any other branch of the mining industry, but because of that no one is entitled to condemn its activities. At the same time for the credit of the country and for the sake of those who do not appear able to resist the temptation of becoming involved in any kind of new venture once a few unauthorised and furtive reports are circulated as to its tremendous possibilities it is to be hoped that the present epoch of activity in diamonds will be free of many of the unpleasant features that characterised the Boshof district boom of a few years ago. So far but little criticism can be directed against the new flotations. In one or two instances rather remarkable estimates as to size and productivity have been made, but it is clear that these calculations will require a lot of convincing corroboration before they are accepted by the public. On the other hand, a number of new and encouraging prospects are being opened up, and, moreover, properties which have long been idle are being re-opened under influential auspices. Diamonds to-day rule at a high figure, and it is readily conceivable that there are numbers of properties in various parts of the Transvaal, the Cape and the Free State which, although they proved unpayable a few years ago at the present time possess distinctly encouraging prospects of yielding dividends. An exactly similar economic change has taken place during the last year or two in Cornwall, where by virtue of the great advance in the price of cassiterite numbers of tin mines formerly unprofitable are now yielding small dividends. So long as speculation is restricted to legitimate enterprises, that is to say, to properties which offer some reasonable hope of reward, no one can quarrel with the present epoch of marked activity in diamonds.

An Expanding Market.

The discovery of one or two new and important mines or the successful resuscitation of dormant ventures on large productive bases might for a time introduce complications in the adjustment and regulation of sales, but it is clear that the market for South African gems, thanks to careful and statesmanlike nursing and to the great wave of commercial activity that seems to be sweeping over Europe and America at present, is a large and expanding one. Everything points, in fact, to the world being able to absorb all the production that the South African diamond fields can give it for years to come and at prices which should prove thoroughly remunerative and satisfactory to this country. Our sole point in sounding a note of warning at this juncture is not with the intention of in any way discrediting *bona fide* efforts to discover new diamond mines or of successfully resuscitating propositions that have been closed down. Our object is to decry any attempts to foist on the public purse syndicates of such questionable character as were launched a few years ago. The majority of these were formed *sans* mine, *sans* diamonds, and *sans* working capital, and their only justification—if justification it be—for existence was that they enriched an unscrupulous few at the expense of the credulous many in the street. Because a syndicate possesses a farm on which rock closely resembling kimberlite exists, there is no warrant for such extraordinary inflation of market prices as was witnessed at the time of the Boshof boomlet.

An Apt Definition.

Admitting that true kimberlite does exist, it remains to be proved whether it occurs merely as a fissure or as a pipe. It further remains to be demonstrated what area the pipe or fissure in question occupies. An additional consideration and a most vital one is whether the kimberlite contains diamonds or not. There are many blind pipes and fissures in the country, pipes and fissures which are barren in regard to diamonds. And again admitting that the prospect in question does contain diamonds, it must be proved that the gems occur in profitable quantities and qualities, for even at present high prices there are propositions which contain diamonds and yet are incapable of being worked at a profit. Proof of all these very essential factors requires time and patient, diligent work. Why the announcement that the such and such syndicate has found a mine should arouse a furore of speculative excitement has always been a matter for considerable wonder to us. Apparently the word "mine" has some very subtle and wonderful significance in application to diamonds. It seems to presuppose a close affinity with De Beers, the Premier or Jagersfontein. These apparently are mines and the failures are not. We believe the definition of a mine as adopted by the British Home Office is that it is any working in which it is necessary to introduce artificial light. There is a less dignified definition which we refrain from publishing. The Home Office's interpretation of the word seems to be particularly applicable to certain diamond prospects of which we have had knowledge in the past, in that they required light—whether artificial or natural is beside the point. But the enlightening influence was apparently denied those who sought it until the débacle. After all, those who will operate in the dark have only themselves to thank if they commit errors.

Transvaal Coal Trust.

The Transvaal Coal Trust Co., Ltd., notify that under an arrangement with that company and the Springs Mines, Ltd., the shareholders of the former are entitled to participate in the Springs Mines debenture issue. Applications for debentures must be lodged either at the London bankers, Standard Bank of South Africa, Ltd., 10, Clements Lane, Lombard Street, London, E.C., or the head office of the Transvaal Coal Trust Co., Ltd., Corner House, Johannesburg, on or before April 30. The last day on which registration can be effected to obtain these rights is to-day, April 26th.

Aurora West.

Revenue £56,584 14s. 6d., or 27s. 1·675d. per ton from 41,699 tons milled; cost £42,947 14s. 6d., or 20s. 7·187d. per ton; profit £13,637, or 6s. 6·488d. per ton; capital expenditure, £1,766 11s. 6d. The working profit shows an increase of £517 11s. 3d. over that of the previous quarter.

THE EXPANSION OF MINING.

Enormous Growth of Gold Production—Ratio Between Gold and Silver Outputs.

IN a recent issue we dealt briefly in a leading article with the noteworthy Presidential Address delivered by Mr. Bedford McNeill to members of the Institution of Mining and Metallurgy in London. The speeches of Presidents of the Institution of Mining and Metallurgy as representing the views of the leading member of the premier mining institution of the world are always read and studied with the greatest interest, and Mr. McNeill's dictum is certainly no exception to the standard of excellence and thoughtful review that the I.M.M. presidential addresses have established. Not since Mr. Hennen Jennings lectured on "A Sovereign's Worth" has, however, a President delivered such a highly important oration on the extension of mining and the rise of particular branches of the industry as did Mr. Bedford McNeill, and we therefore return to a consideration of some of his statements on the growth of metalliferous mining. The statistics relative to the ratio between gold and silver production are of the widest financial and industrial significance and have, we believe, attracted much attention in banking and commercial circles.

"The outstanding feature of progress for the last thirty-three years," declared Mr. McNeill, "is, in my opinion, to be found in the enormous extension of mining, and the consequent corresponding increase in the production of the metals. Especially has the rate been accelerated during the past ten years. I have prepared a table (see below) showing the world's production of the metals during the years 1889, 1891, 1901, and 1911.

INCREASE OF WORLD'S PRODUCTION OF METALS.

	1889.	1891.	1901.	1911.	Percentage Increase for Ten Years ending 1911.
	Tons.	Tons.	Tons.	Tons.	
Pig iron ...	—	—	41,000,000	65,000,000	58
Copper ...	261,205	279,391	526,000	881,000	68
Zinc ...	329,600	356,200	500,000	900,000	80
Lead ...	540,200	589,000	850,000	1,100,000	29
Tin ...	55,400	59,500	88,000	116,000	32
Nickel ...	1,800	4,700	9,000	21,000	144
Aluminium	70	328	7,500	16,000	513
Mercury ...	3,700	3,700	3,000	4,000	33
Silver ...	4,100	4,700	5,300	7,500	41
Gold ...	—	—	380	680	79
Antimony ...	—	—	10,000	23,000	130

	1880. Tons.	1881. Tons.	1884. Tons.	1885. Tons.
Copper ...	153,959	163,369		—
Tin ...	—	—	41,400	—
Aluminium ...	—	—	—	13

The above figures, except gold and silver, were kindly verified by Messrs. Henry R. Merton and Co., Ltd.

It is particularly the comparison between 1901 and 1911, say only ten years, to which I would direct your attention. In no instance for the latter year is the increased production less than 29 per cent., and that is lead; copper and zinc increase 68 per cent. and 80 per cent. respectively; antimony 130 per cent.; nickel 144 per cent.; and with aluminium the production is multiplied no less than five times.

SOME POINTS CONCERNING THE RELATIONSHIP BETWEEN GOLD AND SILVER.

"The production of silver in 1901 was 5,300 tons, in 1911 it was 7,500 tons, the increase being 41 per cent. In the case of gold, the production in 1901 was 380 tons; in 1911, 680 tons; an increase of 79 per cent. It may be mentioned, incidentally, that at the Royal Mint, during the year 1911, the gold dealt with was no less a quantity than 142 1 10 tons (avoirdupois). *Gold.*—Taking gold first, for the 108 years from 1493 to 1600, the average annual production was a little under a quarter of a million ounces. Taking the next 100 years, from 1601 to 1700, this figure approximated to a little less than one-third of a million ounces; for the next sixty years, 1701 to 1760, the output approximated to two-thirds of a million ounces. From the earliest date (1493) until 1840, there is only a gradual rise in production, but from 1841 onwards the increase markedly sets in. The discovery of gold in California was in 1848, and in Australia in 1851, and the effect of these two discoveries is shown in the output for the next forty years:—From 1851 to 1860 the average annual output was 6.4 million ounces; from 1861 to 1870, 6.1 million ounces; from 1871 to 1880, 5.6 million ounces; from 1881 to 1890, 5.1 million ounces. This latter date brings us to the starting of the Transvaal output in 1889, which owes so much to the simultaneous successful application of the cyanide process. We now get an enormous acceleration in output, and in 1911 the total output reported of the world was 22½ million ounces. In other words, the world's present average production in one year is now equal to more than the total production for the sixty years preceding the year 1700. Another way of bringing the gold production vividly before you is the statement that it is estimated that 653 millions sterling was added to the world's stock of gold for the 358 years from 1493 to 1850, whereas for the eleven years alone of this present century, that figure of 653 millions sterling has already been exceeded by the output of 867 millions sterling. Or, again, there has been added to the world's stock of gold during the last fifteen years a quantity greater than the total amount previously known to exist in the civilised world. It is most extraordinary that the gold which is produced under circumstances demanding the highest technical skill, and in the obtaining of which the greatest care is lavished, and for which so many men risk so much, should be destined ultimately to be buried and hidden out of sight, and, as far as we can judge, ruled out of any economic calculations, at any rate for the time being. I need not remind you that the use of gold in a civilised community is not merely, as it were, for itself, but as serving the foundation for an enormous superstruction of credit; and unless, therefore, this absorption of gold can be controlled or directed into channels in accordance with modern conditions, the embarrassment of the more civilised communities, as we regard ourselves, is going, I fear, to become more and more accentuated. It is only fair to mention there are some who argue that this disappearance of gold is the least of several evils, and if it did not so disappear much greater troubles would ensue. The question is, 'Will the absorption of gold displace the absorption of silver in India?' which latter has been calculated by Sir James Wilson as totalling 423 millions sterling for the seventy years ending 1910. Will India continue to absorb silver? One can hardly think that it can absorb both gold and silver, and if India does not absorb silver, what is to be the result? What will be the outcome if the enormous population of India—who have already proved that they are unable to withstand the fascination of 'hoarding'—be still further tempted. The relative production of gold and silver is shown in ounces and also in sterling, the sterling value of the silver being calculated at the ratio existing at the time.

		Gold.		Silver.	
Period.	Number of Years.	Millions of Ounces.	Value in Millions Sterling.	Millions of Ounces.	Value in Millions Sterling.
1493–1660 ...	168	11	£173	1,490	£514
1661–1850 ...	190	113	180	3,320	952
1851–1900 ...	50	334	1,400	4,010	750
1901–1911 ...	11	205½	867	2,062	226
	419	693½	£2,920	10,882	£2,442

The total figures are not very dissimilar, namely, gold 2,920 millions sterling and silver 2,142 millions sterling, but this is explained when we remember the measurement of value by the fixed value of gold. The total world's production of silver from the discovery of America, say 400 years ago, is estimated roundly to have been nearly 11,000 million ounces, and there was, of course, a large quantity of silver in the world before then. Taking the present world's stock, therefore, as being 12,000 million ounces, we have a value at its present price of, say, 1,200 millions sterling, more than one-half of which has been added to the world's stock of silver during the last sixty years.

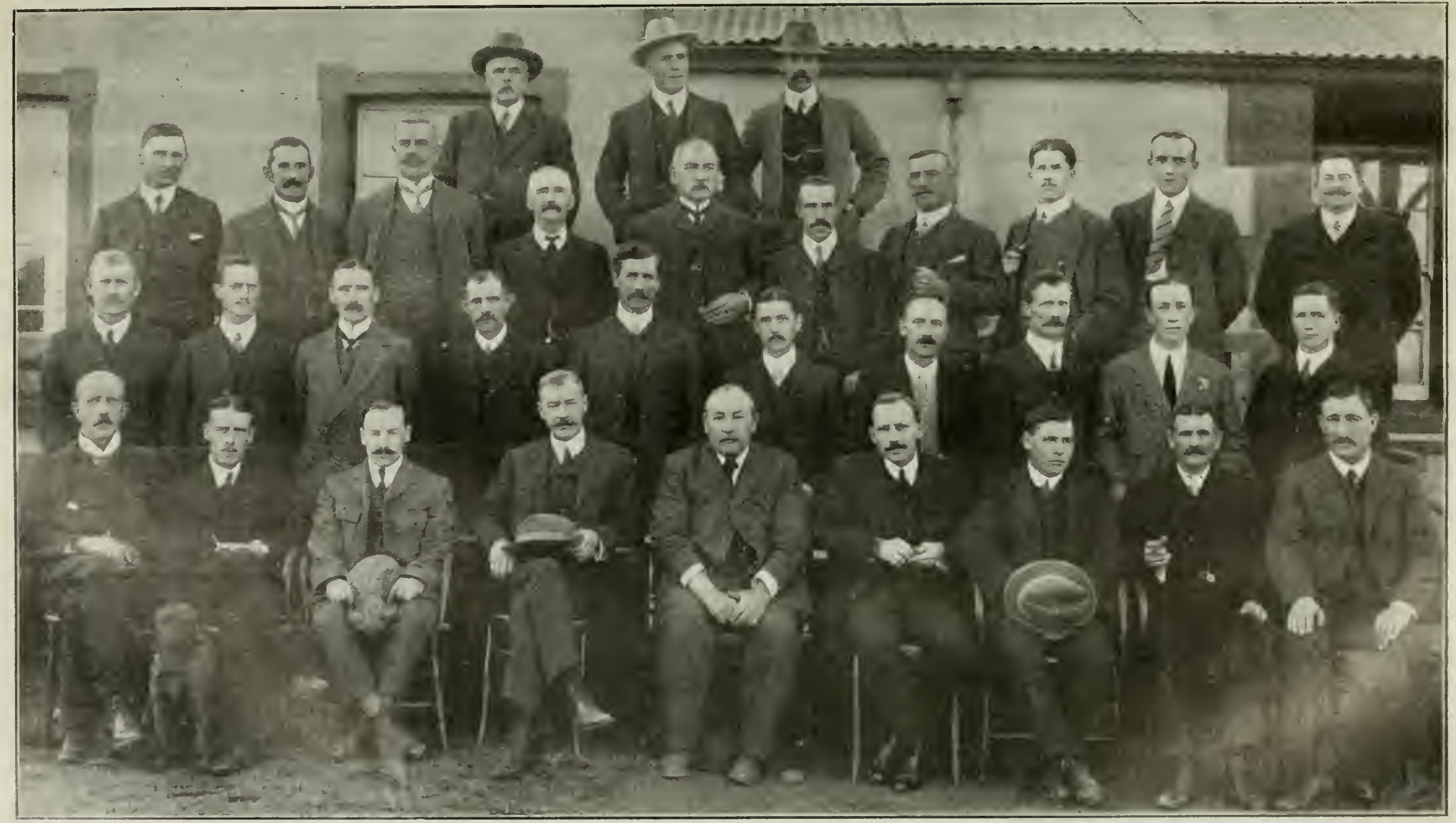
Springs Mines.

The following cable was despatched to the company's London office on the 17th inst.:—"Borehole put down from bottom of the South shaft so as to provide data required in starting connection from North shaft has intersected the reef at a depth of 3,696 feet assaying 11·5 dwts. over 38½ inches."

Central Mining and Investment.

Mr. F. Eckstein, presiding at the annual meeting of the Central Mining and Investment Corporation in mail week, said that during the past year the mining industry of the Witwatersrand had made good all-round progress and the current year should show further results of the innovations introduced by improved efficiency, reduced working costs and increased profits. The corporation had acquired a substantial holding in the De Beers Company at a comparatively low figure.

THE MANAGER AND STAFF OF THE LANGLAAGTE ESTATE AND GOLD MINING CO., LTD.



Bottom Row : A. M. Hunter (storekeeper), J. S. Hutcheson (assayer), H. J. Hebbard (acting underground manager), J. A. Yule (engineer), J. A. Hebbard (general manager, resigned), A. C Webster (resident secretary), A. Hebbard (reduction officer), W. Opie (mine captain), P. J. A. Winter (compound manager).
Second Row : R. Jeffery (shiftboss), J. Y. Hastings (European timekeeper), W. R. Keatinge (clerk), W. Pope (battery foreman), S. V. Mann (surveyor), F E. Williams (chief clerk), S. Rodda (shiftboss), J. Steele (native timekeeper). W. T. Temby (shiftboss), R. J. Skea (native timekeeper).
Third Row : J. Carruthers (cyanide foreman), C. Moth (foreman mason), A. J. Mills (foreman boilermaker), W. H. Morcom (shiftboss), J. Gillies (foreman carpenter), E. Crowther (chief electrician), W. J. Reid (foreman blacksmith), J. Pope (shiftboss), J. Jeffery (shiftboss), F. J. Strick (foreman fitter, Estate).
Back Row : R. Naukervis (shiftboss), H. A. Grant (foreman fitter, Block "B"), C. Darby (surface foreman).

MINING PROGRESS IN MANICALAND.

Official Quarterly Review by the Director of Mines.

The value of the production of the first quarter of 1913 shows an improvement on the figures of any of the four quarters of 1912 and marks, we trust, the commencement of an era of gradually improving production. The improvement in the value of the production for the quarter is due to the better output of the Bragança Mine which, although not yet running its full number of stamps, ran an average of 17 stamps approximately 58 days and contributed £3,731 out of the total production for the three months of £4,726. As stated in our quarterly review of the third quarter of 1912, it is probable that the Bragança will only commence crushing full time with its full complement of twenty stamps in July of this year. Three Wilfley tables were installed on this mine at the end of last year as stated in our last quarterly review and 16 1/2 tons of concentrates were obtained in the three months, January to March, of this year with an estimated contents of 62 ounces fine gold and of a total estimated value of £265. The chief events that have occurred in the quarter under review have been the cutting of the reef in the 240 foot or second level of the Bragança Mine and the steady progress that has been made by the Andrada Mines, Limited, in their preparations for dredging the alluvials of this field. The reef was cut on the 240 ft. level of the Bragança Mine on the 26th March at a distance of some 60 feet from the main shaft and approximately at the point where it was expected that the reef would be met with. The breadth and general appearance of the reef at this point are considered satisfactory. Very considerable progress has been made during the quarter by the Andrada Mines, Ltd., in their preparations for dredging work on the alluvials of the field. The posts for the 15,000 volt electric transmission line from the Inhamucarara to the Revue have been erected, the excavation of the paddock where the dredge is to be built has been completed, and the machinery for the shops, including a drill press, an 18-inch engine lathe, and 18-inch shaper, a power hammer, a pipe cutting and threading machine, etc., has arrived, the shop has been built, the camp for the workmen to be employed on the building of the dredger has been completed and the expert employees engaged for this work have already arrived from America. Some prospecting with the keystone drill has been done on the Zambuzi, one of the affluents of the Revue not far from its junction with the latter, and a number of shafts are at present being put down on the Mudzi river, another affluent of the Revue in the vicinity of the dredgers formerly belonging to the ill-fated Mazoe Company, in order to thoroughly test the auriferous alluvial ground on that stream where ancient workings of very considerable extent are to be met with. The Guy Fawkes Mine, which has been one of the two principal producing mines of the territory, the other being the Bragança, was handed over on the 28th January last by the owners, the Mozambique Macequece, Ltd., to the new tributor, the mine having been previously freed from water down to the 600 ft., or lowest, level, and the timbering of the main, or Creek, shaft having been repaired. From the end of January up to the present, the mine has unfortunately not been worked on a sufficiently large scale for it to be possible to obtain therefrom remunerative returns, but there exists a large quantity of unstoped ore between the 4th and 6th levels, and in what may be called the central section of the mine, which appears to be of a promising nature. It is much to be regretted that so far operations have not been more energetically pushed forward. During the quarter under review, the smaller propositions of the field that were working have been the same as in the previous quarter and a better output has been produced by them, in spite of the fact that the heavy rains that have continued throughout the first quarter of this year have in some cases impeded mining work. It seems probable that development work may be resumed in some months on the Edmundian Copper Mine. The main shaft on this mine has reached the 9th level where a station has been cut and a resumption of development work would mean the driving of a new level at this depth.

THE OUTLOOK FOR FRANK SMITH DIAMONDS.

A Brief Forecast of Probable Results.

Though not free from delay inseparable from the starting up of a new plant, the resumption of washing operations at the Frank Smith Diamond Mine is now well in hand, and everything should be working smoothly by the end of the month. It may be recalled that the Frank Smith Diamond Estate and Exploration Co., Ltd., capitalised at £300,000, in 800,000 shares of 7s. 6d. each, whereof £201,843 15s. represented by 528,250 shares are in issue, owns the whole of the Frank Smith and Welgelegen Mines in the Barkly West district, representing 625 claims approximately, together with 10,845 acres of freehold land excellently situated for farming sheep and cattle, in close proximity to the mines. The recent reorganisation of the company's finances for a cash working capital of £108,000, and the opening up of the mines and erection of new machinery and plant was taken in hand under the direct supervision of Mr. T. G. McLelland, whose name is intimately connected with the diamond mining industry in South Africa. In view of the advent of washing operations, it will not be amiss to recall the past history of the mine's production and its relation to the results anticipated when the mine is in full working order. In contemplating this aspect of the company's prospects, it should be noted that the quality of the stones produced is good, the average of the past product sold being 54s. 6d. per carat, even though fully 20 per cent. of the total was sold during the diamond slump. The increase in the value of diamonds of recent years lends itself to the confident assumption that diamonds which the company sold in 1901-6 at 58s. per carat would now realise from 70s. to 80s. per carat. The next factor to be considered is the yield, and in dealing with the scale of operations, the minimum yield from a direct treatment plant is taken as 4 carats per 100 loads. This estimate appears to be well on the conservative side, as we find that in 1906 161,744 loads of blue ground from a depth of 113 feet were washed and floored for an average recovery of 4·82 carats per 100 loads. The next question is that of costs, and in Mr. McLelland's opinion, with an efficient direct treatment plant working on a substantial scale, the costs of treatment should not exceed 1s. 6d. per load. Taking these various factors, *i.e.*, the recovery at 4 carats per 100 loads, a value of 70s. per carat, and the number of loads washed per diem at 4,000, it will be seen that the probable profit per annum on a million and one quarter loads will be £81,250, equivalent to a little over 40 per cent. on the issued capital. Even supposing the costs of treatment have been underestimated, and that 2s. per head is a more correct estimate, then on the conservative estimate the profit will probably be £50,000, equal to 24¾ per cent. on the issued capital. Taking it, however, that owing to the installation of the up-to-date and better plant an increase of 20 per cent. to 25 per cent. in the recovery on what it was formerly, can be effected, it will be found by a little calculation that taking the recovery at

5 carats per 100 loads the probable profits indicated above would be increased to £125,000 and £93,750 respectively, equal to 61·43 per cent. and 16·11 per cent. on the issued capital. The plant is designed to treat 4,000 loads per diem, equivalent to 1,252,000 loads per annum, excluding Sundays, but assuming that only one million loads are treated per annum with the aforementioned factors substantial profits on the issued capital should be won. Messrs. Barnato Brothers are largely identified with the company, and associated with them in the direction are Messrs. L. Ehrlich & Co., while Mr. T. G. McLelland is the managing director in South Africa, assisted by a local committee on which the two houses referred to above are represented. Taking everything into consideration and viewing the prospect from a most conservative point of view, there appears to be a prosperous future before the company.

THE WEST RAND CONSOLIDATED.

Progress of Development—Preparing for the Larger Mill—Encouraging Prospects at Depth.

Whilst it is to the Further East section that the Rand has to look for principal expansion in output, the fact must not be lost sight of that on the other limb of the Main Reef series the West Rand Consolidated Mines is being prepared for a substantially larger production than hitherto has been practicable. Nearly all the new mills, or extensions of existing equipments, one might say all the new mills and extensions, erection of which is contemplated by the Mining Houses are for the Further East Rand, and the proposed enlargement of the West Rand Consolidated reduction plant is therefore of marked and particular interest. The Randfontein Central has not yet at work its full enormous complement of crushing power, represented by 1,000 stamps and tube mills. It is unlikely that on this property any further additions to milling equipment will be made; not for a number of years at any rate, and the West Rand Consolidated may accordingly be regarded as the only mine west of Roodepoort which is likely to add to its equipment in the near future.

Extension of Plant Agreed on.

It may be recalled that in the latter half of last year it was decided to have the necessary plans and specifications drawn up for the extension of the mill and cyanide works to a treatment capacity of 60,000 tons per month. Last year 100 stamps and 4 tube mills crushed 334,420 tons, or an average of under 30,000 tons per month, so that the contemplated increase will be very considerable. Although these plans and specifications have been prepared the Board has decided to postpone the actual placing of orders for the new plant "until the existing ore reserves have been definitely and appreciably increased to such an extent as to amply justify its erection."

More Development Necessary.

In view of this official statement the position in regard to ore reserves as at the end of last year calls for investigation. The payable tonnage fully developed and ready for stoping at 31st December, and to which a probable grade could be assigned was estimated at 1,116,733 mining tons, of an average assay value of 6·02 dwts. over a width of 49·5 inches. To this total might be added a further 120,467 tons of payable rock, for which, owing to insufficient data, a final valuation could not at the time of making up the report be given. In addition to the above fully developed ground, 206,175 tons showed in the estimates as "partly developed, payable," and "partly developed, probably payable," for a large proportion of which an average mine grade was indicated. It should be noted that the fully developed and ready for stoping ore was stated as 1,116,733 mining tons of 6·02 dwts. per ton value. In order to consider this tonnage in relation to the proposed increase in capacity of milling plant, it will be necessary to reduce the mining tons, *i.e.*, tons as they exist in the mine and ready for stoping to milling tons, that is, ore as it will pass into the mill bins after a certain amount of waste rock has been rejected. Last year 17¼ per cent. of the ore mined was sorted out, and applying this figure to the 1,116,733 tons referred to above, we arrive at a total of about 923,000 tons as being fully developed and available for milling. This would suffice to keep a battery consuming ore at the rate of 720,000 tons per annum going for about 15 months, which admittedly does not represent a large reserve ahead of milling requirements. Even after making a liberal allowance for ore partially developed and ore blocked out and not fully valued, the reserves of the West Rand Consolidated at the end of 1912 could not be regarded as representing more than 18 months' supply for a plant of 60,000 tons per month capacity. It is clear therefore that despite the excellent results obtained from development on the Battery Reef from the point of view both of width and value, and also the encouraging aspect of the development work on the property as a whole, the directors have acted wisely in not giving effect to the plans for enlarging the basis of production until there is a larger supply of ore in reserve.

This Year's Activity.

With this objective development is now being expedited with a view to reaching the desired ore reserve position as soon as possible. In this connection attention may be called to the development statistics contained in the last quarterly report of the company. It is not the practice of the General Mining and Finance Corporation group to state in three-monthly reports the actual tonnages blocked out during the quarters in question. Some idea of the active nature of the development policy now being undertaken may, however, be gained from the report for the three months ended 31st March, 1913, in which it is stated that during January, February and March of this year 50,235 feet were driven, sunk and risen. These figures may be considered in conjunction with the statement in the last annual report that during the year 16,397½ feet of development work in all sections of the mine were achieved. The average monthly footage for 1912 worked out at 1,366 feet, whereas for the first three months of the current year an average of 1,674 feet were driven, sunk and risen each month. In other words, development has been expedited to the extent of nearly 25 per cent. Assuming that this rate of exploitation is continued throughout the current year the ore reserves at the end of 1912 should show a very substantial increase over those blocked out at the end of 1912, and the directors should soon be in a position to sanction the giving out of orders for the new equipment.

The Battery Reef in Depth.

In concluding this article on a proposition the prospects of which have improved greatly during the past few months, reference should be made to the importance of the recent intersection of Battery Reef in a cross-cut from the Rand "A" shaft. This latter is situated about 2,500 feet to the south of the Rand shaft and commands a large and important section of deeper level ground. Intersection of the Battery Reef was effected at a point which corresponds to the horizon of the third level of the Rand shaft. The assay value of the first three sections sampled is 6·3 dwts. over an average width of 58 inches.

Rand Collieries.

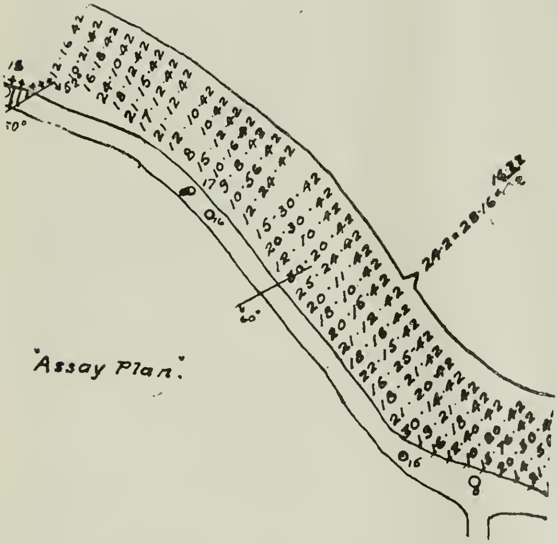
During the quarter the total footage accomplished (the whole being at the horizon of the tenth level) was 840½ feet. The cross-cut east from the incline shaft towards the end of January encountered a reef lying above the usual shale footwall, and driving north and south was immediately started, the cross-cut being continued as a winze on this reef.

MINE SAMPLING AND ORE VALUATION, WITH SPECIAL REFERENCE TO THE WITWATERSRAND AREA.—V.

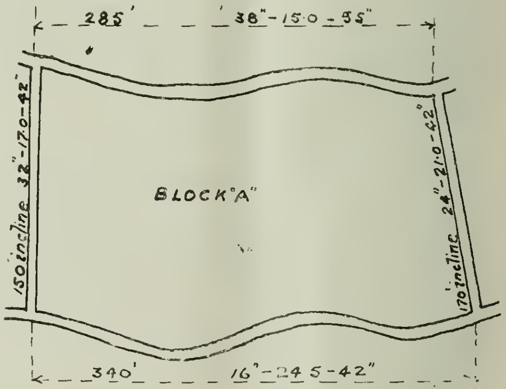
[By Arthur S. Lejeune.]

Chapter IV.—The Assay Plan and the Methods of Deriving Information Therefrom.

An assay plan is a plan showing all development and stope faces and the various assays of the different places. In the case of development values it is a good scheme to show the reef width, reef value and stope width; for example, 32—7·0—42. In this case the first figure 32 is the reef width, the second, 7·0, is the reef value, and the third figure, 42, is the stoping width. These values are written along the side of the development faces and are placed in the position of sampling, *i.e.*, if the sampling has been done at regular 5 feet intervals the values are placed 5 feet apart on the scale of the plan. The best scale for an assay plan is 1/500, because if a smaller scale, say 1/1000, be adopted, the distance, 5 feet, will be so small that all the assays are crammed one on top of the other and so make the plan illegible. On the other hand, if the plan were on a scale of, say, 1/250 it would become too unwieldy. Another reason for suggesting the scale 1/500 is that, if this scale be adopted, the assay plan may be taken as a tracing from the underground plan, which is, on the Witwatersrand, always drawn to a scale of 1/500. The following illustration shows a portion of an assay plan. The figures arranged thus, 12—16—42, means that at this particular point of the drive there are 12 inches of reef averaging 16 dwts. per ton, and that the stoping width has been estimated at the minimum, that is, 42 inches. The figures outside the bracket indicate the average value for the whole block of which that portion shown on the sketch is only a part. These figures are interpreted as 21·2 inches of reef at 28·16 dwts., or 16·22 dwts. over a stoping width of 42 inches. The widths are usually put in in red figures and the values in blue. It will be seen that the development figures show reef width, value and stope width, whereas the stope figures show reef width and value as well as stope width and value. It is possible from the assay plan alone to determine the value of a block of ground, *e.g.*:—



Assay Plan.



Let the above represent a block of ground bounded by two drives and by two raises as shown. Now looking at the above sketch it will be observed that several lengths are given and the average value along the four sides. In the assay figures given thus, 38—15·0—55, the first figure is the reef width, the second the reef value and the third the stope width. This block is then averaged as follows:—

Table showing how Block "A" is to be calculated.

Heading.	Feet.	Reef width.	Reef width x feet.	Reef Value.	Reef Width x feet x value.	Stope Width.	Stope Width x feet.
1st Level Drive ..	285	38	10,830	15·0	162,450	55	15,675
No. 2 Winze ..	170	24	4,080	21·0	85,680	42	7,140
2nd Level Drive ..	340	16	5,440	24·5	133,280	42	14,280
No. 1 Winze ..	150	32	4,800	17·0	81,600	42	6,300
	945	26·61	25,150	18·41	463,010	45·92	43,395

Stope value
10·67

The average reef width is obtained by dividing total "reef width × feet" by total feet, and the average reef value by dividing total "reef width × feet × value" by total "reef width × feet." Similarly the average stope width and value are found. Thus we have the average of the block as 26·61 inches reef @ 18·41 dwts. =

$$\frac{10{\cdot}67\text{ dwts.}}{45{\cdot}92\text{ in. stope width.}}$$

To determine the tonnage in this block, it is necessary to take the mean of the lengths of the drives, *i.e.*, mean length

$$= \frac{340 + 285}{2} = \frac{625}{2} = 312{\cdot}5 \text{ feet,}$$

and the mean of the inclined length of the winzes. In this case the lengths given are inclined lengths (it will be shown later in the Chapter on Ore Reserves how the tonnages are obtained if the blocks are shown in plan) and all that is necessary is to take the arithmetic mean of these, *e.g.*,

$$\frac{170 + 150}{2} = \frac{320}{2} = 160.$$

The area of the block is now 312·5 × 160 square feet. The stoping width is 45·92 inches, ∴ the cubical contents of the block are

$$312{\cdot}5 \times 160 \times \frac{45{\cdot}92}{12} \text{ cubic feet.}$$

Now there are 12 cubic feet to the ton of the reef under consideration, so that the required tonnage is

$$\frac{312{\cdot}5 \times 160 \times 45{\cdot}92}{12 \times 12} =$$

15,941 tons.

(To be continued.)

THE "LIFE" OF THE NEW KLEINFONTEIN.

Recent Rumours Set at Rest—Interesting Discussion.

THE feature of the annual meeting of the New Kleinfontein Co., Ltd., this week was the very frank discussion of the various rumours recently circulated in regard to the life of the mine. Col. Dalrymple, having reviewed the finances and the development position in detail, quoted Mr. Way's report on the question of "life." At the close of his speech the following discussion took place:—

Mr. Lionel Cohen said he understood that the Board was in possession of a report made by the late manager not carrying out the figures that were given in the report by the consulting engineer, and he further understood another report was made recently which gave the life of the mine at 8.5 years. He would move that these two reports be laid on the table, and that the same be embodied in the report circulated to shareholders. Mr. Baxter seconded.

Mr. Baxter: What is the probability of liquidating the debt? How long a period will it take to liquidate it? With present profits it seems to me it should be liquidated in a matter of from twelve to eighteen months.

Mr. Grant asked if there was any truth in the rumour of amalgamation with the Apex and the Benoni companies.

The Chairman said with regard to the rumoured amalgamation with the Apex and Benoni, there is nothing before the Board of any amalgamation of the Apex and Benoni with the New Kleinfontein company at the present time. As for the liquidation of the debt, a great deal depends on what dividends the company declared. "If we declare no dividends," continued the chairman, "your liability can be got rid of very quickly, and, naturally, we have to consider the position very carefully in view of the dividend approaching in the month of June, and this is a matter which has not been discussed by the directors so far. Suppose you go on paying about 12½ per cent. this year and next year, as far as we can see, given normal profits in the neighbourhood of £25,000, you should be out of debt at the end of next year, probably before, but I am giving you a figure which I hope we shall be able to reach. Mr. Cohen has asked a very pertinent question; that is, whether certain reports have been made by certain people. I am not prepared to show any documents in connection with this company which are not direct reports to the board of directors. You must realise that these things are very difficult. Certainly, estimates have been made by the late manager in connection with the life of the mine, and these have not been in accord with the views of the consulting engineer. The report was in the form of a letter to the consulting engineer, and not to the Board of Directors. The life of the mine is a matter which we think should be dealt with very carefully by the consulting engineer. You have got to bear in mind that these reports get in circulation somehow or other, and ex parte statements are made. I do not think that such a report, which is not an official report to the Board of Directors, should be embodied in the annual reports of the company, unless, of course, shareholders insist upon it. Now, you refer to some other report. I don't know what report you refer to: there is no other report I know of in the hands of the Board. When other interested houses ask for permission to look into the affairs of the mine they always obtain that permission from this Board of Directors, and several houses have had that opportunity on behalf of European shareholders and other clients. This is not a close corporation. We look on the Kleinfontein, as we look on other companies, as a public corporation, and so long as the object for which they ask to go through these mines is a fair and reasonable one, we give them permission; but sometimes, gentlemen, it is abused. If you would like to ask the consulting engineer anything on the question of the life of the mine, do so.

Mr. Cohen: Am I in order in replying?

The Chairman: Yes.

Mr. Cohen: I believe on these fields, if another engineer or surveyor is given permission to go over a mine it is customary to furnish the Board of Directors with the report that he makes. I believe it has been the case that an engineer connected with or official of the East Rand Proprietary Mines made a report confirming Mr. Torin's figures.

The Chairman: Sir George Farrar asked for permission for a certain Mr. Krynauw to go through the Kleinfontein mine. There was no question of any report. That Mr. Krynauw has no doubt made a statement to Sir George Farrar in some form or other I do not question.

Mr. Higgins: That report was entirely a private matter.

The Chairman: Which shows there is a great leakage in connection with the running of these companies, and information gets out which is not in a condition to be thrown into the streets, and may probably be used for "bear" purposes by decrying the assets and goodwill of the company.

The report and accounts were adopted.

THE POSITION OF THE WITWATERSRAND DEEP.

Water Difficulties—Native Recruiting Troubles—Increased Dividends Foreshadowed.

THE fifteenth ordinary general meeting of the Witwatersrand Deep, Limited, was held in the Board Room, Cullinan Buildings, on May 16th, Mr. A. G. Gill presiding. Among those present were Messrs. G. C. Fitzpatrick, W. T. Graham, W. H. B. Frank, J. Berry, F. W. Baxter, E. Wolfes, R. Goldmann, L. Cohen, and H. G. L. Panchaud, secretary. The Chairman, in moving the adoption of the report and accounts, said: The directors' report and the financial statements, together with the consulting engineer's and manager's reports, which we are to consider to-day were issued to you some time ago, and, as you have doubtless studied them thoroughly, I propose making but a brief reference to only a few of the items mentioned in those documents. You will have noticed that in spite of all the difficulties that had to be surmounted the ore reserves showed an increase of 56,055 tons, and the quarterly report for the quarter which ended on the 31st March last shows the ore reserves as at that date as 1,515,578 tons at 6.9 dwts. over 50 inches, as compared with 1,492,257 tons at 6.83 dwts. over 50 inches at the 31st December last. The actual development figures for the quarter just mentioned show that of 3,378 feet of reef 2,973 feet had been sampled, and that 2,703 feet, or 90 per cent., averaged 10.37 dwts. over 10 inches. These figures are most satisfactory, and I am pleased to be able to tell you that the development work continues to expose ore of excellent value practically throughout the mine. The most encouraging feature is that the grade of ore so far exposed south of the water dyke from the 15th to the 17th levels is well above the average of the ore reserves, as is clearly shown in the following estimate of the average values exposed in the individual drives up to the end of March last:—15th level west and east, 920 ft.; 51 in.: 8.6 dwts. 16th level, east, 429 ft.; 51 in.: 12.7

dwts. 16th level, west, 578 ft.; 60 in.; 12.2 dwts. 17th level, east, 295 ft.; [illegible] in.; 5.8 dwts. 17th level, west, 331 ft.; 50 in.; 6.0 dwts. Giving a total of 2,553 ft.; 53 in.; 9.3 dwts. In addition to these figures you have the further information, which was published, that the reef where struck in the 18th level main cross-cut from the east shaft assayed 30.8 dwts. over 37 in. This is the lowest level in the mine, and the strike certainly justifies the expectation that the ore opened up on this level will prove to be of as good value as that contained in the levels immediately above it. I may mention that the last fifteen feet driven east and west on this level gave an assay value of 20 dwts. over five feet.

WATER DIFFICULTIES.

When addressing you last year, your chairman told you that the company was passing through an anxious period, owing to the manner in which mining operations generally were being hampered because of the large quantity of water that had to be handled in the mine, and it is most satisfactory to be able to record an improvement in that respect, for we are now pumping one and a half million gallons per day, as against a little over two and a half million gallons a little while back. You will realise what a handicap this water has been in the working of the mine, so I do not intend to attempt to make any excuse for the smaller profit of £205,007 as compared with £301,542 for 1911, the higher working costs and the lower grade. The water is well in hand, and the pumps are capable of dealing with two and a half million gallons from the 18th level, so while, as a rule, it appears to me to be a great mistake to make forecasts when one is dealing with a mining proposition, I will go so far as to express the opinion that you may look for better profits and an improvement in the amount of development work done, provided, of course, that we are not called on to face a shortage of labour; otherwise, I do think that during the remaining months of this year we ought to make £25,000, or better, per month. If this forecast should prove to be somewhere near the mark it is obvious that you will soon be drawing increased dividends.

NATIVE RECRUITING.

With reference to the subject of native labour, I daresay you are expecting me to give you my views in regard to the prohibition by the Government of the further recruiting of natives in Central Africa, and all I have to say is that I entirely agree with the action taken by the Government, because the winning of gold at such a terrible cost of life could not possibly be continued. However, it is only fair to say that a considerable amount of money has been spent in a genuine endeavour to find some means whereby the natives could be rendered immune against pneumonia, which is responsible for most of the deaths. You are aware that all the mines decided to join the Native Labour Recruiting Corporation, which started operations on the 1st October last, and you will realise that, even if the formation of the corporation only results in preventing a further increase in wages and the cost of recruiting, which it undoubtedly will do, the mining groups acted wisely in agreeing to join the corporation and abolish their own organisations. The Miners' Phthisis Act has come into force since your last annual meeting, and this company has been called on to pay £7,039 to the Phthisis Board for the period 1st August, 1912, to 30th April, 1913. There are no means by which it is possible to ascertain what amount of money you are likely to be called upon to contribute towards the Compensation Fund between now and August, 1914, when the fund will go out of existence, and each company will be obliged to pay to the Board a yearly sum equal to 5 per cent. on the wages earned by all underground white employees. The report and accounts were adopted. In reply to a question, the chairman said he expected the company would pay a better dividend this half-year than in the previous half-year. Messrs. W. T. Graham and J. Friedlander were re-elected to the directorate. Messrs. W. R. Moon and Thomas Douglas were reappointed auditors.

CAPITAL EXPENDITURE IN 1912.

Amounts Paid for Machinery and Materials—Last Year's Additions to Equipment —Thirty Mines Expend Over a Million and a Quarter.

In recent issues, we have, in response to requests for information on this important aspect of the industry, attempted analyses of capital expenditures incurred by Rand gold mining companies during last year. Probably the major amount of interest attaches to statistics as to amounts disbursed on account of machinery and equipment, and in order to bring out the enormity of the market that exists on the Rand for manufacturers of mining machinery we append hereunder a statement showing the amounts paid out under these headings by the companies mentioned last year. On account of the lack of uniformity evident amongst different controlling Houses in regard to segregation of accounts, it is impossible to assess exactly the amounts disbursed for machinery only. Thus, in some instances, expenditure on equipment and buildings are grouped together, and it is impracticable to separate the one from the other. Under these circumstances it is not possible to show the absolute expenditure on plant only, but in the appended schedule the great bulk of the money involved is for various kinds of machinery. Not all the companies on the Rand are dealt with. The attached schedule deals with mines which concluded their financial years at the end of December last. The aggregate total, it will be observed, amounts to the goodly sum of £1,264,728 for the thirty companies concerned, an amount which should assist one to realise the great value of the mining machinery field that exists on the Witwatersrand.

Aurora West	£6,795
Apex	11,155
Brakpan Mines	48,728
Bantjes Consolidated	8,581
Cinderella Consolidated	27,760
City Deep	12,272
Consolidated Langlaagte	189,298
Crown Mines	230,967
Durban Roodepoort Deep	16,131
East Rand Proprietary	94,812
Geduld	20,144
Geldenhuis Deep	22,787
Jupiter	21,056
Lancaster West	2,805
Meyer and Charlton	5,713
Modder B.	22,797
Modder Government Areas	9,999
Modder Deep Levels	9,716
New Goch	2,790
New Kleinfontein	51,065
Princess Estate	12,081
Robinson	2,918
Roodepoort United Main Reef	1,520
Rose Deep	5,979
Randfontein Central	239,127
Simmer Deep	55,786
Van Ryn Deep	42,807
Village Deep	42,428
West Rand Consolidated	13,817
Witwatersrand Deep	32,894
	1,264,728

Brakpan Mines.

The following official information with respect to the April output of Brakpan Mines has been supplied to us:—Stamps working, 160; running time, 26 days; ore crushed, 53,870 tons; tube mills working, 8; ore hoisted, 66,227 tons; waste sorted, 17·9 per cent.; fine gold declared, 17,949 ozs.; value declared, £75,556, equal to 28s. per ton milled; working costs, £51,251, equal to 19s. per ton milled; working profit, £24,305, equal to 9s. per ton milled. Results were again adversely affected by the temporary loss of stopes reported last month, which has been followed by greater disorganisation than was then anticipated. The stopes are now in stable condition, and it is expected that May results will show material improvement.

Rhodesian Section.

LATEST MINING NEWS.

Mining Machinery Imports—Selukwe Columbia's Output—Illegal Pegging—Rhodesia, Ltd.—Susannah Mines—Umtali News—Wood Cutting at Hartley—Cam and Motor Ore Reserves.

IMPORTATION of machinery into Southern Rhodesia has shown considerable expansion lately, mainly on account of the arrival of plant for the Shamva mine consequent on the opening of the line to the Abercorn district. In March last there was imported into Southern Rhodesia £25,700 worth of machinery from oversea, while during the first three months of the year over £70,000 worth has been imported. Included in this is, no doubt, a certain amount of agricultural, industrial, and other machinery, but the bulk of the imports must undoubtedly be attributed to the activity following the opening of the Shamva Railway. The values of the more important items imported into the country on behalf of the mining industry during 1911 and 1912 are exhibited in the accompanying tables:—

	1911.	1912.
Quicksilver	£3,358	£2,111
Antifriction Grease ...	3,704	2,753
Electrical Machinery ...	5,982	9,811
Mining Machinery ...	99,513	67,339
Machinery Parts	88,704	81,615
Wire Rope	6,286	3,129
Zinc	6,745	6,627
Candles	28,521	21,668
Oils	30,605	35,835
Blasting Compounds ...	73,310	86,321
Cement	10,364	11,718
Cyanide	31,837	27,091

* * * *

The March output of the Selukwe Columbia included 126 ozs. of gold recovered from gold absorbed by furnace. The value of the month's output was £7,159; the working costs were returned at £4,828.

* * * *

The Mining Commissioner, Hartley, reported to the Sanitary Board a week or two ago that in connection with the Board's allegation that certain mining claims had been illegally pegged and registration granted through incorrect information, he had ordered the forfeiture of the claims referred to. This was not considered satisfactory by the Board, and it was resolved to ask what further proceedings were being taken. A further letter from the same office advised that no registrations other than the foregoing had been granted within the area described since same was promulgated—there were still several mining locations current within the township and the 200 feet limit, which were pegged prior to the promulgation of the Government notice which, if abandoned or forfeited, would not be open to relocation. This information was accepted by the Board with thanks.

* * * *

Cablegram from the local to the London office of the Rhodesia, Ltd., company:—During March 147 ft. of development have been accomplished by hand labour at the Sabiwa mine. Should have air compressor in operation beginning of May. Shaft No. 4 is down 44 ft. below No. 3 level. Winze has been sunk to a depth of 24 ft. below No. 3 level, average value being maintained. In No. 3 level the drive to the south has been extended 35 ft., making a total of 301 ft. Cross-cuts Nos. 7 and 8 in hanging wall are in disturbed zone, both unpayable. Fully expect to strike pay ore further to the south. In the drive at No. 3 level to the north, the reef looks well; 40 ft. from shaft reef is 36 inches wide, assaying 1 oz. 1 dwt. per ton; 45 feet from shaft reef is 26 inches wide, assaying 1 oz. 9 dwts. per ton; 50 ft. from shaft reef is 32 inches wide, assaying 8½ dwts. per ton. Face of drive in good ore and reef getting wider. Prospects are very favourable.

* * * *

The following note on the position of development at the Susannah Mines has been published by the London office of the company:—11th level, north shute, north drive at 33 ft., 43·3 ins. wide, assays 21·7 dwts.; 11th level, spur reef at 19 ft., 47·4 ins. wide, assays 5·76 dwts.; 10th level, spur reef winze at 90 ft., 33 ins. wide, assays 6 dwts. Lady Lina: No. 2 level south winze at 111 ft., 50 ins. wide, assays 10·5 dwts.; No. 3 level south drive at 51 ft., 48·5 ins. wide, assays 4·6 dwts.; No. 3 level north drive at 61 ft. 6 ins., 57·2 ins. wide, assays 7·8 dwts. Another message states: 11th level (north shute) drive north: Has advanced 6 ft. from main winze to 43 ft.; at 40 ft. reef 21 ins. wide, assays 22 dwts. 4th level south drive from winze in face: Has advanced 2 ft. to a distance of 6 ft. from centre of winze; at 5 ft. reef 3 ins. wide assays 45 dwts.

* * * *

It is reported from Umtali that important developments with regard to the old Pardy mine have recently taken place, whereby Mr. Aubert, of Macequece has come to an arrangement with the owners of the mine to use its machinery and plant for a period of nine months from the date when the shaft will be free from water, with the right to continue its use for a further twelve months. He has also (so it is said) been given the right to float a company to acquire the property for the sum of £10,000, and one-tenth of its registered capital.

* * * *

At the last meeting of the Small Workers' and Tributors' Association held at Hartley, the chairman stated that the cutting of wood fuel in the Hartley district had become one of grave importance owing to the fact that the Cam and Motor G.M. Company had recently given a contract for the supply of 150,000 cords of wood, and that the contractor had marked down for cutting belts of timber in the vicinity of the Shagari group of mines. He understood from Mr. Montagu that the company was entirely within its rights in going that far afield. However that was, their course was clear. They must immediately lodge a formal protest with His Honour the Administrator. Mr. Wheildon stated that the contractor had already laid a light railway to a point within seven miles of Mabel's Luck, and he foresaw that in a very short time the whole district would be denuded, and who would suffer? Not the Cam and Motor Company, who were close to the railway, and, in fact, had a siding at its very door, but the unfortunate mine owners twenty miles away from the railway. Mr. Mack said that mine owners were not going to sit still and see their timber belts cut out, and unless the Government stepped in and put a stop to it he prophesied that there would be the biggest row that had been known for some time past. It was decided that a formal protest be drawn up and forwarded to His Honour the Administrator.

* * * *

As to the Cam and Motor it is of great interest to note the exceedingly sound position of development at that proposition. The engineers report that the tonnage blocked out ready for the mill amounts to 1,016,240 tons of a gross value of £2,262,150, equivalent to 5½ years' supply for the plant. The ore reserves being in such a satisfactory position, work is now concentrated, in addition to preparing the mine for stoping, on the erection of the plant.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Diamond Cutting Industry.

MR. A. JUDLIN ON MR. BRINK'S PAPER.

To the Editor, *South African Mining Journal.*

Sir,—I have read the full text of Mr. W. Brink's lecture at Kimberley on the 8th inst., and in reply refute all his arguments against the diamond cutting industry being introduced into South Africa, by a letter to the *Cape Argus*, Capetown. In addition to my letter, Mr. G. Hay and Mr. V. Wolff, also in the *Cape Argus*, also refute Mr. Brink's arguments. In Friday evening's *Star*, dated the 16th inst., Capt. C. B. Strutt publishes an interesting letter also in answer to Mr. Brink, and informing us of the impossibility up to now of floating any company in Europe owing to the influence of the persons connected with the diamond trade in London. The best reply against the arguments of Mr. Brink, in my opinion, is the finding of the Select Committee, which by six votes to one is in favour of the diamond cutting industry for South Africa. This finding has only been come to after the most exhaustive examinations of witnesses at Capetown for some weeks past. Four out of the six recommend a tax of 10 per cent. on rough diamonds leaving South Africa, two recommend a 2 per cent. tax, the revenue to be used in encouraging the cutting industry. Senator Campbell, the only one who voted against the tax, also against the establishment of the industry, is from Natal, which Colony produces no diamonds, and has practically little or no interest in the diamond trade. Now, in returning to Mr. Brink's lecture, I notice that he says, in quoting some figures, that the United States of America export £70,000,000 of cotton every year, which is perfectly correct, but not in the raw state, as one is made to believe by him, but as manufactured goods. This is a very different state of affairs and is against the arguments of Mr. Brink and not for. The following figures show the increased progress of the cotton trade in U.S.A. from 1860 to 1910 after a protective tariff. Number of bales used for cotton goods manufactured in U.S.A., and their value in dollars:—

Year.	Bales.	Dollars.
1860	841,975	116,681,774
1870	1,026,583	177,489,739
1880	1,865,922	192,090,110
1890	2,604,491	267,981,724
1900	3,603,516	332,806,156
1910	4,516,779	628,391,813

In 1860 the United States of America employed in cotton manufacturing 122,028 workers, including women and children, earning a yearly total salary of 24,000,000 dollars, and in 1910, after only twenty years of real protective tariff, the workers numbered 378,880 with total yearly salaries of 132,859,045 dollars, also showing in proportion a large decrease of the numbers of women and children employed. These figures are only quoted to prove that if Mr. Brink's statements can be so incorrect in respect of the cotton trade in America, they may be quite as unreliable in respect to the diamond trade, and it is quite easy to understand why the decision of the Select Committee of the Senate which (by six members against one) decided that the diamond cutting industry can and must be established in South Africa for the welfare of the country. The majority of six only differed as to the best ways and means to attain that end, as their recommendations clearly show.—Yours, etc.,

A. JUDLIN.

The Red Cross Society.

To the Editor, *South African Mining Journal.*

Sir,—At the invitation of a friend interested in ambulance matters I was present at a meeting held last evening in the Lecture Theatre of the Transvaal School of Mines, Eloff Street, Johannesburg, the conveners being Messrs. W. Cullen and F. Rowland, for the purpose of considering the formation of a Red Cross Society. Being keenly interested in the good work done by first aid societies, I arrived at the meeting with a perfectly open mind and ready to support the new society, more especially in the particular portion of the country where I reside, but after a heated discussion, in the course of which the real reasons why the meeting had been convened were made clear to me I felt I must leave the meeting with disappointment. According to the explanation made by some of the promoters, in reply to questions, any unbiasssed person present must necessarily come to the conclusion that primarily the meeting was called in order to (a) give certain disappointed ex-members of the St. John Ambulance Association's General Committee an opportunity to vent their personal spite against the Chairman of the Transvaal Centre of that Association, and (b) circumvent the strictness of the Mining Regulations by introducing a cheap class of ambulance certificate on the mines to take the place of the present St. John Ambulance Association's certificate, which sets a fairly high standard of knowledge. As regards the personal quarrel between a handful of local Johannesburg gentlemen and the chairman of the St. John Ambulance Association in the Transvaal, I think it a great pity that such a paltry consideration should be made to form part of the foundation of the new society, more especially as, according to figures supplied at the meeting, the St. John Ambulance Association is still doing an enormous amount of good and is rapidly extending its operations in every direction. Point (b) is the more important one, because it was definitely stated at the meeting that the main reason it is thought necessary to form a new society is that the rules and regulations of the St. John Ambulance Brigade are too rigid and require too much practice on the part of its operating units. Well, I have had an opportunity of inspecting the regulations referred to, and I find that all a member of a division of the St. John Ambulance Brigade is required to do in order to keep himself efficient is to attend at least twelve practices and one re-examination per year. As the promoters of the new society consider this provision irksome the logical conclusion to be drawn is that the members of the Red Cross Society will not be called upon to practise so often and their efficiency will not be maintained. They would, therefore, with the little knowledge of first aid work required during the course of lectures, be let loose on the public and constitute more of a danger than a help. It is evident from the remarks made by some speakers that the officials on certain mines, who are required to be in possession of first aid certificates, are of the opinion that the present St. John Ambulance Association's certificates are not obtained easily enough and that a new kind of certificate to be obtained through the Red Cross Society will not be so difficult to procure. If this be the case it is hoped that the Union Government and the Honourable the Minister of Mines in particular will not allow the Red Cross Society's certificates to be officially recognised on the mines. In conclusion, to prove how elastic the St. John Ambulance Brigade regulations are, I quote Rule 30, which reads:—"There is not necessarily any connection between a division of the Brigade and the local Centre of the Association. Nor has a local Centre any voice in the management of a division or any seat on its Committee. The two are distinct."—Yours, etc.,

"ONLOOKER."

Johannesburg, 22nd May, 1913.

THE DIAMOND-CUTTING INDUSTRY.

Findings of the Select Committee—Two Minority Reports— Majority Favour a South African Industry.

The Majority Report and two Minority Reports were presented to the Senate, last week, by the Chairman of the Select Committee on the Diamond Cutting Industry. The Committee was appointed to consider the advisability of encouraging the establishment of a diamond-cutting industry within the Union, and the means by which such encouragement may be effected. The Majority Report, signed by Senator G. G. Munnik, chairman of the Committee, is as followa: Your committee has examined a large number of witnesses, from whom it has obtained information of a valuable character bearing directly and indirectly upon the subject it has been asked to inquire into. It has also obtained papers and returns from within the Union and from Europe which are of special value in connection with the matter, and the inquiry covered the whole range of the terms of reference. Your committee has arrived at the following conclusions from evidence:—The value of the total production of the Union to date is estimated to be over 170 oillions sterling, while for the last twenty years (1893-1912) it amounts to £119,093,587, and it is interesting to note from the evidence given that the diamond industry is still likely to be flourishing at the end of the present century. The export of uncut diamonds in 1912 amounted to the local declared value of £10,061,489 from the Union, and approximately £1,800,000 from German South-West Africa, a total of about £12,000,000. Production from other countries is small, and, from a competitive point of view, insignificant. The output for 1912 is the largest recorded, but does not appear to have exceeded the actual buying demand. That year's revenue derived directly by the Union from this source was approximately £800,550, viz.: De Beers, £317,000; Premier Company, £403,550; and Jagersfontein Company, £50,000; and by the German Government approximately £363,425. It will be observed that while the revenue derived by the Union Government includes its ownership share from the Premier Mine, there is no contribution from that source in the way of indirect taxation of profits, as in the case of De Beers and Jagersfontein; so that the direct revenue received from this industry was £397,000 in 1912. Notwithstanding an ever-increasing production, there has been a progressively higher average price obtained for rough diamonds with the exception of fluctuations during certain periods of depression, and your committee is informed that during the last twenty years diamonds have increased in value by 150 per cent., and in the last five years by 67 per cent. It seems, therefore, reasonable to suppose that this tendency towards a progressive increase will be maintained with the growth of the world's wealth. The output from German territory is at present confined almost entirely to small alluvial stones, and remains a very uncertain factor as regards the future. There has recently been a re-adjustment of the German Government charges and deductions, which amount at present to about 42 per cent., varying according to amount of working expenses, and there is no indication whatever of any abandonment of this substantial impost. The output of South African diamonds, after extensive and elaborate sorting for the European market, is disposed of partly to an influential financial syndicate who handle about half, and partly to dealers and master cutters or their buying representatives. Regarding capital, it would appear that financial relations adjust themselves, cash transactions, as a rule, obtaining up to the cutting stage. After the gems are cut a system of extended credit generally prevails. Control as to limitation of output exists in order not to push supplies beyond the demand of the market. Master cutters, generally called cutters, are those who own large and small factories and employ workmen, women and children, of varied skill, to cut and polish stones purchased from the syndicate or from other dealers. Cutting and dealing are combined in many instances. There are some 23,000 persons engaged in the cutting of diamonds, at a cost of, approximately, £5,000.000 per annum. The bulk of the cutting is done in Amsterdam and Antwerp, where the industry has grown to large proportions within the last forty years, owing to the certainty of production from South African mines. Cutters are also established with varying degrees of importance and success in China, England, France, Switzerland, Germany, and America, and it is evidenced that in the last-named country a great quantity of the very best stones are perfected. America is at present the largest buyer of South African diamonds, and also—for boring and industrial purposes—buys from Brazil. The diamond-cutting business is a paying one, and one or two small factories have been started in the Transvaal; but it is alleged these were unable to procure continuously from producers the range and variety of stones which are essential. Generally, producers like De Beers sell under contract to the London Diamond Buying Syndicate for certain stated periods, or, as in the case of the Premier Company, through their regular agent in London, to dealers. Smaller producers, as a rule, sell locally, but cutters allege that, as they were unable without the greatest difficulty to secure the required range of rough stones locally, they, after a brief struggle, found themselves compelled to cease cutting. They are, however, clear as to the possibility of cutting profitably if stones were made readily available. These facts account, partly at all events, for the non-success hitherto experienced in cutting diamonds in the country of production, where the conditions of light and climate are admittedly most suitable. Present conditions in South Africa—not necessarily the creation of financiers but the result of customs long established—must be taken into account, and the conclusions of your committee carry the responsibilities of a possibility of disturbing a highly organised and successful industry. It is evident, however, that if the friendly, whole hearted co-operation and assiatance of the larger diamond mining corporations were obtained, the realisation of success by local cutting factories would be immensely facilitated, if not entirely assured.

THE ESTABLISHMENT OF A DIAMOND-CUTTING INDUSTRY IN SOUTH AFRICA

Your committee is convinced that it is desirable to establish in South Africa a diamond-cutting industry, and is assured also that it is feasible to accomplish this under certain conditions. Evidence is conclusive that foreign skilled labour can be obtained at rates which will not prove prohibitive, and it appears to your committee that the establishment of the industry here will, amongst other advantages, give an opportunity to the youth of South Africa, of both sexes, to acquire an art which will afford employment of a lucrative and permanent nature. Your committee has inquired into the relative cost of living in this country and in Europe, and considera that the very high rate of wages paid to employees in the diamond-cutting trade removes, to a considerable extent, any necessity for considering minutely differences of personal household expenditure that may exist, the margin of income being sufficiently wide to allow of a reasonably high standard of living being maintained either here or in Europe. At the same time, it is clear that the wages paid locally would have to be substantially increased as compared with the European standard, but steady workmen could, without doubt, save as much, if not more, money here than in Europe out of such increased wages. Furthermore, the fact that continuous work would be assured here, which is not the case in Europe, and also that the light and climatic conditions are more favourable in this country, would undoubtedly prove important attractions, tending towards lowering the rate of wages required in this country. The present import duty constitutes a sufficient protection to enable local cutters, if the necessary range of stones is available, to supply the limited local demands of jewellers for cut goods, estimated at about £80.000 per annum in value. The evidence supports the conclusion that every increase in the price of diamonds, owing either to taxation of profits, cost of production, or addition by the seller, has hitherto fallen on the consumer, and your committee sees no reason for thinking that future experience will be at variance with the past in this respect. There is no proof that an increased price has in the past resulted in a decreased output, the contrary always having been the fact. It has been suggested that the establishment of a cutting industry in this country would lead to increased facilities for illicit dealings in diamonds, but your committee does not consider the risk involved to be such as to justify a non possumus policy. Any factories established would necessarily be placed under Government regulations, which there is no reason to suppose responsible licensed persons would seek to evade. It has also been urged as an objection to the establishment of a cutting industry in this country that there might be difficulty in obtaining purchasers in South Africa for the diamonds when cut. It is undoubtedly desirable that a market for such stones should be established here, and it is not unreasonable to suppose that buying agencies would be established here for that purpose; but even if this were not so, there would be no insuperable difficulty in exporting cut instead of rough diamonds. It has been suggested that an excise or export duty on diamonds would militate against the alluvial diamond digger, but your committee is satisfied that with a market for rough diamonds in South Africa, such digger would get the benefit of the impost. Meanwhile, however, the Government should consider the advisability of taking steps to assist the diggers by appointing official valuators on the different fields, to enable the people there to obtain legitimate prices for their goods.

After mature deliberation, your committee recommends that the Government should take into serious consideration the desirability of promoting conditions under which diamond cutting may, at an early date, be established as an industry within the Union. As a means to attaining this object, your committee offers the following suggestions for consideration:—(1) That Government, through the lever of its large interest in some mines, should make a determined effort to secure the co-operation of the producing companies in the establishment of a sufficient local market in rough diamonds so that those willing to establish local factories may be sure of facilities for obtaining stones. It is felt that this can be brought about. It should obviously be immaterial to the producers whether their stones

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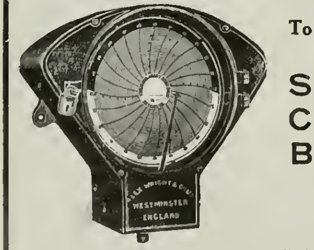
are sold in South Africa or London. The case would be met without any further interference in existing arrangements if the producing companies would each agree that as and when the demand arose from local factories sufficient diamonds for their requirements would always be available at current producers' selling prices. and your committee believes that this can be arranged. Only as a last resort would your committee suggest that recourse should be had to legislation, but in case that should become necessary your committee directs attention to the fact that the Transvaal Ordinance of 1903 provided for the Government holding a six-tenths interest in the diamond mines, and in 1908 only was this altered by legislation to a 60 per cent. interest in the profits. If the Government's interest were again to become a share in the Premier Mine itself, the Government would hold a share of control in the management and in the disposal of the output, and so secure a local market at all events for those diamonds. (2) That a protective tax of 10 per cent. be imposed as an excise or export duty on the value of all uncut diamonds sent out of the Union, which tax, in the opinion of your committee, would have the effect of encouraging and establishing a cutting industry in South Africa.

(*To be continued.*)

THE TESTING OF PRETORIA PORTLAND CEMENT.

How Fluctuations in Quality are Guarded Against.

In concluding his paper on the manufacture of cement, read before the South African Institution of Engineers last week, Mr. Z. Davidson said:—The chemical laboratory is one of, if not the most important parts of an up-to-date Portland cement factory, for it is here that the quality of the output is primarily regulated. Samples of the raw materials are tested at regular and frequent intervals during the 24 hours, as well as the cement and coal. Coupled with this department is the physical laboratory, where samples of the cement clinker as coming from the kilns is ground and thoroughly tested from the average of every twelve hours' run. By this means we know at once the result of a day's burning, and have a fair indication of what we may expect of a heap of clinker long before it is ground into cement. Then an average of the daily grinding of clinker into the cement store house is tested in a like manner, so that we have an absolute check on the quality of the cement contained in a certain bin; added to this is a complete test, chemical as well as physical, of the average of all cement ground during the week. As a final test, each and every truck of cement which leaves our factory has an individual test. As a result of these tests and the system which is followed out, any truck of cement despatched since 1905 can be traced back from test to test, from the truck to the bin, from the bin to the grinding of the clinker, and from the burning of the clinker to the raw mixture. In other words, we know exactly from day to day just what we are doing and just what we are producing. Naturally this involves considerable work and much expense, but it is money well spent, for the basis of success in any undertaking, and more especially of one of this nature, is to know at all times the quality of your output and be in a position to lay your finger on the weak spots and correct them. One thing the consumer of Pretoria Portland cement may be sure of, and that is that the manufacturers know full well the quality of every consignment of cement leaving their factory, and are able at a moment's notice to produce a full history of that particular cement from the time the raw mixture was ground until the finished product left the company's works. No factory in the world is carrying out this work to any such degree. One point I would like to call your attention to before closing is the system we have of averaging in the several departments of our factory, and of which I hope you will make special note when you visit our works. In the first place instead of running our limestone, which, by the way, is a tertiary limestone, coming from Pienaars River, directly into our mill, it is off-loaded into heaps of several thousands of tons at the mill site. In this way we obtain a uniform average by cross-cutting from the heap. As the mixture is being ground it passes into stock bins containing several hundreds of tons capacity, and is drawn off at different points. As the raw mixture is completed it is stocked in a bin of 600 tons capacity, which feed the kilns, and this bin has discharges at 24 different points feeding into screw conveyors. The two kilns then discharge into the one clinker conveyor, and as it comes from the cooler it is heaped in layers, one full day's run upon that of the preceding day, so that when the heap is ground the week's clinker heap is again averaged. This is then stored in bins holding about 5,500 casks each, which, when it is packed out into bags, is averaged again. When you see the system as it is carried out you must agree that it would be quite impossible to get fluctuations in quality in any particular shipment.



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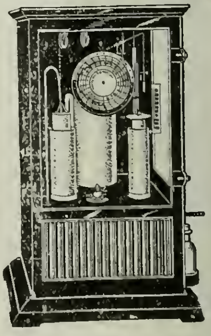
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Engineering Notes and News.

THE COMPRESSED AIR SYSTEM OF THE RAND MINES POWER SUPPLY CO., LTD.—II.*

By A. E. HADLEY.

The compressed air required for the various mines had to be supplied at an average pressure of 100lb. per sq. in. delivered on the property of each of the consumers. The initial demand involved a maximum load of about 30,000 kw.; but this has since been nearly doubled. All the advantages of centralisation of power production, such as the use of large units, saving in capital and operating, diversity amongst the mines, spare plant, etc., apply to this form of power supply. The system of centralising the compressor plant and transmitting by pipes was therefore adopted. The distance between the two extreme mines served by the air-pipe system is approximately fourteen miles. The total length of pipe laid is twenty miles, varying in diameter from 24in. to 9in. The problems attaching to this method of power distribution had not previously heen considered on so large a scale, and in view of the small amount of data and experience available the successful installation and operation of this air system are of some interest. After a consideration of a number of possible alternatives for giving this supply both economically and reliably, it was finally decided to instal steam-driven rotary compressors at Rosherville Dam, and to erect an electrically-driven compressor station at Robinson Central Deep, a point six miles to the west, where a supply of water was available for cooling purposes, the two stations operating in parallel on a common trunk pipe-system. The additional cost of two stations as compared with one was found to be more than offset by the saving in the cost of air mains and by the beneficial influence on the power factor of the compressor motors at Robinson Central; these motors were designed to operate at a leading power factor of 85 per cent. at full load. Six steam-driven rotary compressors have consequently been installed at Rosherville, and six similar compressors, electrically driven, at Robinson Central, each compressor being rated at about 3,500 kw. input. The orders for these machines were distributed among the three firms who tendered, namely, the Allgemeine Elektricitäts Gesellschaft, Pokorney Wittekind, and Gütehoffnungshütte. These machines are the largest compressors yet constructed, 1,250-kw. capacity, representing the construction limit previously reached. To meet the increase in the demand three additional steam compressors, each rated at 7,000 kw., are under construction. In order that a uniform price might be charged for air and electricity an air unit was adopted, the basis of which has already been mentioned, and may now be considered in greater detail. Before electrification the mines obtained their compressed air supply by reciprocating steam-driven compressors at each mine. The agreement defined that the consumers should pay the same price for any given quantity of compressed air as they would have paid for the indicated steam energy necessary to enable their reciprocating compressors to produce this quantity of air, assuming that they bought this steam energy at the same rate per kilowatt hour as they were paying for electrical energy for other purposes. This involved measuring the quantity of compressed air which could be delivered for each 1.34 indicated-horse-power-hour (1 kw.-hour) developed in the cylinders of the consumers' reciprocating compressors. The formula for isothermal compression is:—The work done compressing a unit weight of air isothermally where—

$$= R\,T \log P/P_0$$

R = the gas constant for air,
T = absolute temperature of intake,
P = absolute final pressure,
P_0 = absolute pressure of intake.

This gives the work done in compressing air isothermally from one pressure to another at any temperature, and it can be expressed either in foot-pounds or in kilowatt-hours. Thus the quantity of air compressed isothermally from one pressure to another at a given temperature by 1 kw.-hour is known. This quantity is greater than the quantity which can be compressed in a commercial compressor, the difference being due to inefficiency caused by the losses of the compression process compared with isothermal compression, frictional losses, and losses through leakage. The commercial unit was consequently determined as a certain proportion of the quantity of air would be isothermally compressed by 1 kw.-hour; this proportion depends on the overall efficiency of the reciprocating mine-compressors.

As each independent compressor would differ in performance from all the others it was agreed that the compressors should be tested "by sample," and six machines were selected to represent the types of all in use. Their weighted average overall efficiency was found to be 64.1 per cent., so that the commercial air unit was fixed at 0.641 of the quantity of air which would be compressed isothermally by the expenditure of 1 kw.-hour. Up to this time no meter had been developed for the measurement of air energy, and much experimental work was necessary to evolve a suitable instrument. When one considers the time taken to produce a successful electrical energy meter, it may be claimed that the development of a satisfactory air meter constitutes an engineering achievement of considerable interest. The tests of the six compressors on the mines had to be conducted in South Africa, and as no meter existed then, and the usual methods of testing compressors were far from accurate, new methods had to be devised to determinate a unit on which the purchase of power worth £250,000 a year for twenty years was to be based. The measurement of the discharge from the compressors through orifices was decided upon with the idea that the performance of the compressors could be recorded against these orifices, which could then be standardised by further experiments in South Africa or in Europe. A master meter was designed by the Rand Mines, Ltd., and constructed by Messrs. Fraser and Chalmers, which was ultimately erected in an air-testing station at the Ferreira Deep Gold Mine. This meter is a three-crank displacement meter of a very large size, and has been specially designed so that any clearances, leakages, etc., which would reduce the accuracy, have been made a minimum. Being a displacement meter, a direct measurement of the air is obtained without the introduction of empirical formulæ. Though a large machine, standing about 10ft. high and 15ft. long, it is so sensitive that it gives consistent and accurate results for a flow of air through an orifice 1-10in. in diameter. The orifices used in the compressor tests were compared with this master meter and their co-efficients determined. Subsequently an opportunity presented itself of comparing the work done in air measurement in South Africa with the collateral work done in England when developing the air meters. When the results were compared it was found that there was not more than ½ per cent. difference between the two. The work of testing the six sample compressors was undertaken jointly by the engineers of the Rand Mines, Ltd., and those of the Victoria Falls and Transvaal Power Co., Ltd., and occupied twelve months.

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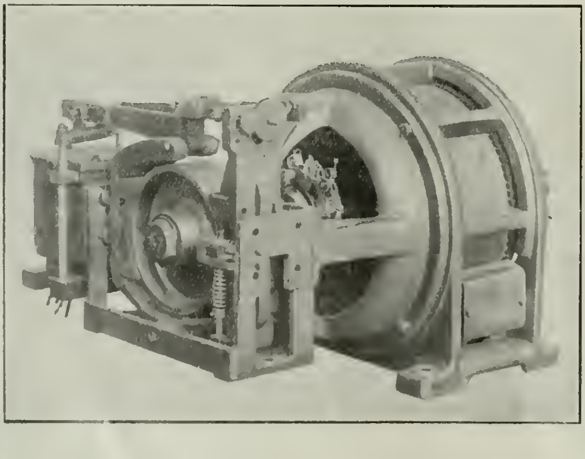
* Extract from a paper read before the Institution of Electrical Engineers.

OPERATION OF AIR SYSTEM.

The results of the operation of the air system have been observed over the twenty months since the supply was first put into commercial use, and have been very satisfactory. Before the compressors were put into commission considerable doubt existed as to whether satisfactory parallel running of such large compressors on a common pipe system could be obtained, as it was feared that the machines might tend to hunt with a variation in the lode on the system unless they were automatically controlled. A system of automatic control was fully considered, but it was decided not to proceed with it until the compressors were tested. In the design of the compressors care was taken to make the characteristic curve between the load and pressure as similar as possible on the different compressors. Experience has shown, however, that there is no difficulty in parallel running with the compressors installed, and that the engineers-in-charge are able to operate the compressors satisfactorily. Only one or two cases have been recorded of a compressor dropping out to atmosphere, and this has only happened when there has been some abnormal disturbance on the electric supply system. The steam-driven compressors have operated satisfactorily from the start. A series of careful monthly tests have been conducted for some time past by taking throughout the working day 10-minute readings of the output from the compressors and of the meter readings and pressures at the consumers' mines. It has been found that of the air units sent out 95 per cent. have been recorded at the consumers' meters, 3 per cent. have been lost in transmission, and 2 per cent. are unaccounted for. These tests have also shown that the diversity between the various mines, of which there are ten, is very small, not exceeding, as a rule, 5 per cent. during the working day. The monthly air load factor is at present 50 per cent. The drop in pressure to the various mines varies according to the distance and the size of the pipe, but with the pipe-system laid down the average pressure-drop is not more than 6lb. The pressure-drop for every load was carefully calculated before the pipe-system was installed, and in practice it is found that the observed delivery pressure does not vary more than 2 per cent. from the calculated figures. Careful observations are also being taken of the condition of the pipes, and up to the present there is no reason to suppose that much deterioration will take place. Of 4,000 joints which are designed to allow for contraction and expansion only those within a radius of half a mile from the stations, where the temperature variations are greatest, have required attention. The joint used in the pipe line is of the spigot and socket type, the jointing material consisting of an india-rubber ring, which is made tight by a gland.

CONSUMERS' SUB-STATIONS.

The electrical supply at 2,000 volts and 550 volts to the consumers' premises is effected from step-down transformer stations, which are built by the consumers, but are equipped with switchgear and transformers by the power company. There are sixty of these consumers' sub-stations connected to one system, and their individual capacity varies from 10,000 k.v.a. to 2,000 k.v.a., the normal size being 5,000 k.v.a. The standard sizes of consumers' transformers are 1,000, 500, and 250 k.v.a., designed with the primary windings arranged for either 20,000 or 10,000 volts. A temperature rise of 40 deg. C. is allowed above an air temperature of 40 deg. C. The windings near the outgoing terminals will stand a pressure of 15,000 volts between adjacent turns. The high-tension windings are tested to the secondary windings and core with a pressure of 40,000 volts, and the insulators with 60,000 volts. The transformers have been supplied by Messrs. Siemens, the Allgemeine Elektricitäts Gesellschaft, and the Westinghouse Co. The transformers are exported filled with oil, thereby reducing the cost of transport and dispensing with the necessity of drying out after erection. In order to allow for the expansion and contraction of the oil each transformer tank is connected with a second smaller tank fixed on the wall of the sub-station. This expansion tank is fitted with a vertical vent-pipe so that only a small surface of oil is in contact with the air, and by this means sludging is prevented. Each sub-station chamber has a short stack, which induces a natural draft and provides effectual ventilation. Double busbars are provided for each voltage. The high-tension and low-tension switchgear in each sub-station is arranged in different chambers with a central operating passage between containing no "live" material. The "live" chambers are locked, and stringent regulations as to the possession of the keys ensure that no unauthorised person can obtain access; in no case is one man allowed to enter alone. The total capacity of the transformers in operation, including generator transformers and coupling transformers, is unusually large, amounting at the present time to 450,000 k.v.a.; but this will be increased to 508,600 k.v.a. when the transformers delivered and on order are brought into commission.



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Finance, Commerce, and Industries.

Contemplated Railway Expenditure.

The estimates of the Department of Railways and Harbours for capital and betterment works has been issued in book form. These figures have already been published in the form of Parliamentary speeches, but in their present form are more instructive. Taking the railways first, it is proposed to spend a sum of £5,920,502 on the new programme. The biggest item in this total is one of £2,731,631 for new lines and the completion of lines now under construction. Next in importance is the allocation of £1,838.520 to new works on open lines. New rolling stock accounts for £675,526 and travellers will agree that this vote at all event is badly needed. There is an item, " unforeseen works," presumably a kind of contingency fund to which is allocated £100,000, working capital £44,050, and £20,000 for the purchase of the Knysna Railway debentures. The harbours vote is a modest matter of £510,775. The harbour vote is split up as follows: —£344,105 for docks, harbours and wharves, £63,407 for floating equipment, £46,434 for contingencies (by an allowance of 10 per cent.), £30,679 for buildings and land, £18,800 for fixed plant and equipment and £7,350 for lighthouses, beacons and bells. The new rolling stock includes 5 class 15 locomotives, 5 branch line Mallett compounds, and 5 narrow gauge engines. There are also 10 first-class coaches, 8 suburban, 3 N.G. coaches (the inquirer is left to fit the initials with suitable words), and 13 passenger vans. For the goods traffic there are 100 high-sided steel bogie trucks, 50 fruit trucks, 86 short trucks, 10 bogie cattle trucks and 10 bogie low-sided trucks. For the coloured passenger traffic there are 12 first-class saloons, 18 suburban coaches, 20 second-class and 10 composite coaches. In the harbour estimates occur items of £3,990 for channelling and kerbing roads at Congella, £4,180 for levelling and hardening roads at Congella, an expenditure of £1,800 on raising the floor of C shed, and £30,000 for a new harbour tug to supersede the " Richard King " at Durban. Provision is also made for two more sets of harbour moorings, a barge for grab, and a diver's punt. An amount of £3,700 is allocated to the electrical converter, switchboard and other alterations to the coaling plant and £900 for a new stone crusher for the Umgeni quarry. Over the Union generally an amount of £25,000 is voted for sleeper plantations, £5,000 for the road motor service, and £4,050 for bookstalls and advertising.

* * * *

Recent Trade Returns.

A gratifying stability in the trade of the Union and British South Africa generally is shown in the monthly trade returns for March, 1913 compiled and issued by the statistical office of the Customs and Excise Department. For the three months ending March 31st, 1913 a [illegible] consignment of 305,673 lbs. of tobacco was imported. This quantity, valued at £42,961, was made up of 176,034 lbs. of unmanufactured tobacco, valued at £9,186; 22,613 lbs. of cigars, valued at £8,853; 91,619 lbs. of cigarettes, valued at £23,496; and 15,407 lbs. of other manufactured tobacco, of the value of £1,426. In the first three months of last year the tobacco imported amounted to 218,209 lbs., and was valued at £38,924. Tramway material to the value of £1,746, and including £360 worth of rails, and £426 worth of railway stock, was admitted to the Union. In March, 1912, material valued at £1,822 was imported. The total importation in this connection for the first three months of this year was £17,367, and for last year £11,618. A large increase is shown in the importation of vehicles, the total value in goods received by the different trades in the Union being £121,456, against £83,607 for March, 1912. The value of this traffic for the three months totalled £351,870, as compared with £237,596 for the corresponding period of 1912. The automobile trade was almost wholly accountable for the tremendous growth in the vehiclar importation. In the motor-car section cars and parts to the value of £76,005 ere brought in, as against £42,134 worth in March, 1912, and the value of motor bicycles and parts came to £17,190 as aaginst £10,117 in March, 1912. Ordinary bicycles and tricycles show hardly any fluctuation. Machines to the value of £21,512 were imported in March, less than an increase of £100 on March, 1912. There was a decrease of over £1,500 in the cart and carriage importation, the value being £3,387. The importation of other wheeled conveyances totalled nearly the same amount, and showed practically the same decline. The value of automobiles and parts imported for the quarter was £209,506, and of motor cycles £52,019. A very substantial increase in the imports

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of wood and timber is shown for last March as compared with the previous March, the respective values being £108,670 and £65,247. Unmanufactured wood arrived in the largest quantities, there being a grand total of 44,568 cubic feet, valued at £44,568. A total of 586,621 cubic feet of flooring and ceiling timber was imported. The value of this was estimated at £36,138. The value of timber received for the quarter amounted to £268,357, against £256,982 for the same period of 1912.

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Reduction of Railway Rates.

The following is a copy of a letter to the Hon. the Minister of Railways and Harbours by the Secretary of the Chamber of Commerce:—" I have the honour, by direction, to refer to to the Report of the Board of the South African Railways and Harbours for the year ended 31st December, 1912, signed by you as Chairman, and to the section headed " Railway Rates Reductions, 1912," which appears on pages 14 and 15. Therein it is stated:—

" In the light of the general impression prevailing that the consumer derives little, if any, benefit from rates reductions, the General Manager was instructed to have a careful note taken of the wholesale and retail prices of articles affected by the alterations in rates at the principal inland centres prior to the date when the alterations were to come into operation, so that a comparison might be made with the prices of such articles six months later, in order to ascertain what benefit, if any, the consumer had derived from the reductions. This has been done, with the result that at the end of January—*i.e.*, four months after reductions in rates were made—while a certain portion of the rates reductions had been reflected in the wholesale prices charged, little or no reductions had reached the individual consumer, so far as the Administration could ascertain." Then follow two schedules of articles, to which are attached the amounts by which railway rates were reduced and statements as to the wholesale prices of the commodities since those reductions came into force. The effect which this section of the report is evidently intended to convey to Parliament and to the public may be stated thus, viz.:—" That having, through Chambers of Commerce and other organisations, appealed for reductions in rates with the avowed object of bringing about a cheapening of the cost of living and a lowering of working costs, the commercial community have not given the consumer the benefit of the reductions, but have merely taken advantage of the opportunity to enrich themselves." In regard to the general effect of reductions in railage, my Chamber would, in the first instance, remind you that the inland merchant is in the unfortunate position that immediately upon reductions in railage taking effect the value of the whole of his stock is automatically reduced, and, in respect of holders of heavy goods, it is by no means unusual that an individual firm stands to lose many hundreds of pounds. It was for the purpose of giving merchants an opportunity of minimising their losses in this respect that the Railway Administration adopted the recommendation made by Chambers of Commerce to give at least two months' notice of reductions in railway rates. Whilst this affords some measure of relief, yet it is obvious that stocks cannot be worked down below a certain minimum of local everyday need; and, again, in some classes of trade where stocks are turned over perhaps only two or three times a year, it is impossible to " work them down " substantially in a few weeks. It is, therefore, natural to expect that as a rule the full benefit of reductions could only be passed on to the consumer gradually. With regard to the specific reductions made last October, my Chamber, however, feels it necessary to point out that the statements of the Railway Board are, in respect of the selling prices, not in accordance with facts. It is to be regretted that those responsible for the report did not take the trouble to obtain from merchants dealing in the articles referred to information (which would have been readily afforded) as to such necessary factors as movements in f.o.b. values and freight rates. Had this been done, it would have obviated the publication of statements which are largely inaccurate, and which are unjust to the mercantile community. Obviously, the selling price of an article depends on the cost of landing it in this country; and it is well known in the commercial world that during the past twelve months manufacturers' prices in almost all commodities—and freight on many—have substantially risen, and the real position is that, had it not been for the reductions in railage made in October last, the selling prices in this country would inevitably have been raised. The savings which the inland importer effected in railage have been counterbalanced by his having to pay more to the manufacturer. In confirmation of the above statement of the position, my Chamber wishes to call attention to the appended memorandum *seriatim* with the allegations made by the Railway Board. On examination of the information therein given, you will see that the consumer has reaped at least his full share of the reductions, and it is further shown that the merchant carrying heavy stocks in Johannesburg has had to bear a very considerable loss, owing to the depreciation of the value of his stocks by the reduction in railage. In conclusion, my Chamber would urge that, before dealing with purely commercial matters in reports which are to be issued to Parliament and to the public, the Railway Board should first of all consult with those concerned, and thereby avoid making statements which, as in this case, create a wrong impression, and cast a grave reflection on the commercial community.

Situations Wanted.

To MINE MANAGERS & MINE OVERSEERS.

Advertiser, Practical Miner, holder of Certificates S.A School of Mines and Technology, seeks situation as Shift Boss or other responsible position; seven years' Rand Experience (underground). Record of Services proves he is capable of fulfilling any position. Reply—J.L.E., Box 3587, Johannesburg.

MINING MEN AND MATTERS.

Mr. E. A. Wallers has recovered from his recent illness, and left by this week's mail boat for England.

* * * *

Mr. R. N. Kotze, Government Mining Engineer, and Mr. E. Langley, Inspector of Mines, Kimberley, have left for Europe on six months' holiday.

* * * *

Mr. Eugene Callens, who recently arrived on the Rand from Paris, will represent M. Robellaz on the Board of the E.R.P.M.

* * * *

Mr. Sidney J. Jennings contributes a sympathetic biographical notice of his cousin, the late Mr. T. Lane Carter, to the current Bulletin of the American Institute of Mining Engineers.

ANSWERS TO CORRESPONDENTS.

" Exchange."—Legal opinion is being taken in regard to the proposal.

" T. J. R." (Boksburg).—An article on the property appears elsewhere in this issue.

J. Palmer & Sons (Sydney).—As you will see, the page in question is now included.

" Shareholder."—There is no reason why the dividend should not be maintained.

" Lion."—No public issue of shares has been made. They have been privately quoted at about 30s.

" Subscriber " (King).—The address is 2nd Floor, Transvaal Bank Buildings, Fox Street, Johannesburg.

" F. R." (Randfontein).—Thanks for your letter. No useful purpose, however, would be served by printing it.

" Diamond."—The biggest shareholders have agreed to finance the company to the washing stage. Prospects seem excellent.

" Inquisitive " (Germiston).—(1) and (2): Nothing payable has yet been discovered on the property, and that explains price of the shares. Further prospecting may, however, have better results. (3) Quite a sound investment at present prices.

MINERAL OIL INDICATIONS IN SOUTH AFRICA.

IT IS NOTIFIED that the Government has arranged for investigation into occurrences of mineral oil indications within the Union.

Persons who have reason to believe that indications of oil exist in any locality are invited to communicate with the Under-Secretary for Mines, Pretoria, as soon as possible, giving full particulars of the nature of the occurrence and indications; the locality and tenure of the land upon which it is situated, and the best means of access thereto, with all other particulars which may be possible.

FRED. BLUNDELL,
Under-Secretary for Mines.

Office of the Minister of Mines,
Pretoria, 13th May, 1913.

THE WEEK IN THE SHAREMARKET.

More Active but Irregular—Public Interest Growing—Tin and Diamonds in Demand.

Public interest in the market seems to be growing, and, though there was no great rise in prices, a much greater volume of business was put through during the week. Rand gold stocks are being bought for London account, and many of the best descriptions are being quietly picked up locally. All the Corner House stocks are in favour, and City Deeps, Modders and Modder B's are in demand. Of Barnato stocks, Government Areas furnished the sensation of the week, and were sought on the news of the striking of the reef in the south-east shaft. The width is excellent and good assays are probable. Van Ryn Deeps are still being bought in view of an early start with milling operations. Springs Mines have improved on the publication of good development results. Brakpans have been easier on bear rumours, but there is nothing to warrant selling. East Rands have been a trifle easier on Sir George Farrar's non-committal speech, but most other Rand stocks have firmed up in view of the improved outlook in Europe. Should the peace preliminaries be signed in the next few days, a really good market might result.

THE DIAMOND MARKET.

Despite the talk of taxation, nearly all diamond shares have been in demand this week. De Beers are not dealt in locally, but Premiers have been wanted for London. The smaller stocks shared the reflected activity. Frank Smiths suffered a momentary set-back on news of a delay in the beginning of washing. Roberts Victors were firm and Nationals moderately active. Crown Diamonds were quietly picked up, and should improve as the date for start of washing opetations draws near. O.F.S. and Elands were firm. It is understood that the new Lace flotation, Pilandsberg Diamonds, was over-subscribed, and allotment was made last week.

THE TIN MARKET.

Tin shares have been active again this week, led by Zaaiplaats. This stock rose to 50s. on Thursday, and continued to be freely dealt in. Swazis were likewise in demand and rose sharply. Rooibergs improved, though more slowly. Rex Zaaiplaats have been reconstructed, and may now do better. Other new tin counters are expected soon to appear, and a Rhodesian low grade proposition, Leviathon Tin, is well spoken of.

RHODESIANS.

According to mail advices from London, Rhodesians moved sympathetically with Kaffirs. Some hard things are being said about the reticence shown by the Eldorado directors in not earlier giving shareholders information of the subsidence in the mine, which has rendered it impossible to keep up the output. Apparently, considerable dubiety exists as to the exact position even in official quarters. The agitation in the Globe and Phoenix camp continues, and the annual meeting had to be adjourned in order to enable shareholders to come to some decision respecting the composition of the Board. It would appear that the company's financial position needs readjusting. Some attention has been paid to Tanganyikas on the report that both smelters will be in full operation before the end of May, when it is confidently anticipated that an output of 1,000 tons of copper a month will be maintained. The cost, it is anticipated, will not exceed £35 per ton, so that there are, after all, possibilities in the earning capacity of this property.

	Friday, 16th.	Sat., 17th.	Mon., 19th.	Tues., 20th.	Wed., 21st.	Thur., 22nd.
African Farms ..	17 3B	17 3B	17 3B	17 3B	17 3B	17 6B
Apex Mines ..	27 0B	—	26 3B	—	—	26 0
Bantjes Cons. ..	21 9	21 6	21 0	20 6B	21 6	21 6
Benoni Cons. ..	3 4	3 0B	3 0B	3 0B	3 1B	—
Blaauwbosch Dia.	110 0B	110 0B	110 0B	110 0B	110 0B	112 6B
Brakpan Mines ..	81 0B	81 0B	80 0B	81 0B	81 0	78 0B
Breyten Collieries ..	32 0s	32 0s	32 0s	32 0s	31 0B	32 0s
Bushveld Tins ..	0 10	0 10B	0 11s	0 10s	0 10s	—
Cassel Coals ..	—	14 0B	14 0B	—	—	14 0s
City & Subs. (£4) ..	51 0B	51 0B	50 6B	51 6	50 03B	50 9B
City Deeps.. ..	67 6B	67 0B	67 0	66 0B	66 6B	66 0B
Cloverfield Mines ..	6 4B	6 3B	—	6 2B	6 2B	6 2B
Clydesdale Colls. ..	—	—	8 0B	—	—	8 0B
Cons. Investments	—	—	—	—	21 0B	21 0B
Cons. Langlaagtes	28 0	27 9	27 6	27 9B	27 9B	27 6B
Cons. Main Reefs..	18 9*	19 0	18 9B	19 [illegible]B	19 3	19 0B
Cons. Mine Select	—	—	—	—	—	14 0s
Coronation Colls. ..	—	—	16 0B	—	—	16 0s
Coronation Freeholds	—	—	0 5B	0 5B	—	0 4B
Coronation Synd.	—	3 6B	3 6B	3 6B	—	—
Crown Diamonds ..	9 6	10 0	9 0B	9 3	8 9B	9 0s
Crown Mines ..	—	—	—	—	147 6B	—
East Rand Centrals	9 6B	9 6	9 3B	9 3B	9 6B	9 6B
E. Rand Coals (2/6)	1 9B	1 9	1 8B	1 8B	1 9B	1 9B
East Rand Deeps	—	2 3B	—	2 0B	2 4B	—
East Rand M. Est.	—	—	—	—	7 9B	—
East Rand Props.	—	—	57 6	57 6s	55 0B	55 0*
East Rand Debs.	£95s	£91B	£95s	£95s	£95s	£95s
Eastern Golds (1/-)	—	1 8B	1 8B	1 8B	1 8B	1 8B
Frank Smith Dia. ..	14 3	14 6	13 6	14 3	14 0	14 0B
Geduld Props ..	25 0B	25 3	24 9B	25 0B	24 9B	24 6B
General Minings ..	—	—	15 6B	—	—	—
Glencoe (Natal) Colls.	7 0B	7 0B	7 0B	—	7 0B	7 0B
Glynn's Lydenburgs	—	—	—	—	—	18 0B
Government Areas	22 9B	22 6B	22 6B	22 3	22 3	23 3
Hex River Expls.	0 6B	0 9B	—	0 6B	—	0 6B
Jumpers	—	5 6s	5 6s	—	4 0B	—
Jupiters	11 0	10 9B	10 6B	10 0B	—	—
Kaalfontein D. (2/6)	—	0 4s	—	0 1s	0 3B	0 3
Klerksdorp Props.	2 8B	2 8B	—	—	2 6B	2 0B
Knight Centrals ..	12 6B	12 0B	12 3	12 0B	12 0B	12 0B
Lace Props. ..	3 10	3 8B	—	3 7B	3 8B	3 10s
Luipaardsvlei Est.	—	—	7 6B	8 9B	9 3	9 0B
Lydenburg G. Fms.	3 0B	3 2s	3 0B	3 0B	3 0B	3 3
Main Reef Wests ..	13 0	12 9	13 0	13 3	13 0	12 9
Main Reef W. Debs.	£80B	£80B	—	—	—	—
Messina Developnt.	—	—	—	25 0B	—	—
Meyer & Charltons	108 9B	—	108 9B	—	—	—
Middlevlei Esates ..	1 3B	1 2B	—	1503	1 2B	1 3
Modder B's ..	81 6B	81 0B	80 6B	80 0B	80 0B	—
Modder Deeps ..	37 0s	35 9B	36 9s	35 0B	36 6	36 0B
Natal Navigation Col.	15 0B	—	15 9	15 6*	15 0B	15 0B
New Boksburgs ..	—	—	2 0s	—	—	—
New Era Cons. (5/-)	8 0B	8 2	8 0B	8 0B	7 9B	8 0*
New Geduld Deeps	2 4B	2 5	2 5B	2 5B	2 5B	2 6
New Kleinfonteins	23 3B	23 3B	23 0	23 0B	22 6	3 0
New Modders ..	—	—	—	—	272 6*	—
New Rietfonteins	—	—	—	6 0B	6 3s	6 0s
New Unifieds ..	14 0B	—	14 0B	14 6B	15 0s	14 6B
O.F.S. & Trans. Dia.	1 8B	1 9B	1 8B	1 8B	2 0	2 3
Piggs Peaks ..	11 6B	—	—	—	—	—
Potchefstroom Est.	—	—	—	0 9B	—	—
Premier Def. (2/6)	242 6B	—	—	—	—	245 0B
Premier Pref. (5/-)	180 0B	—	—	—	—	180 0B
Pretoria Cement Co.	52 6B	—	—	56 0s	—	55 0B
Princess	6 9B	—	7 0B	6 [illegible]B	—	7 0B
Rand Collieries ..	6 6B	—	6 [illegible]B	6 3	—	—
Rand Klips ..	1 10B	1 11B	1 9B	1 10B	1 10B	1 9B
Rand Nucleus ..	2 8B	—	3 0s	2 6B	2 7B	—
Randfontein Deeps	5 0	—	4 9B	—	5 0s	—
Randfontein Est. ..	29 0	29 6s	28 6B	[illegible]	28 9	28 3B
Roberts Victor ..	33 9B	—	33 9B	32 6*	34 0B	—
Robinson Deeps ..	38 9B	40 0	41 0s	39 9B	—	—
Rooiberg Minerals	37 9B	38 3	38 0B	37 6B	37 6	37 6B
Roodepoort U.M.R.	—	—	—	—	10 0B	—
Ryan Nigels ..	3 6B	—	—	—	—	3 9s
Shebas	5 0s	5 3B	5 0B	5 [illegible]B	5 3B	5 3B
Simmer Deeps ..	2 9B	3 6s	3 6s	3 [illegible]B	3 6s	3 6s
Solomon's Temple Tin	—	0 6s	—	0 [illegible]B	—	—
S.A. Breweries ..	40 0B	40 0B	40 0B	40 0B	—	—
S.A. Lands ..	4 1	4 0B	4 0B	4 0B	4 0	4 0B
S.A. Tin Mines ..	—	—	—	—	0 6s	—
Springs Mines ..	17 0s	17 6	18 0	18 0B	18 3	18 6
Sub Nigels ..	13 6B	13 6B	13 6B	13 9	13 6B	13 9B
Swaziland Tins ..	49 0B	50 0*	52 6B	—	50 0B	51 0B
Trans. Coal Trust ..		49 0	49 0	48 6B	47 6B	17 6B
Trans. Cons. Lands	27 6B	—	—	—	27 6B	—
Trans. G.M. Estates	53 0B	53 0B	53 0B	53 0	—	[illegible] 6s
Tudors	—	—	2 0s	2 0s	—	—
Van Ryn Deeps ..	33 6	33 3	32 3	[illegible]	33 3	33 3
Village Deeps ..	42 0B	—	42 0B	42 0B	42 0B	42 0B
Village Main Reefs	42 0	—	—	—	—	—
Vogel. Cons. Deeps	—	2 0s	—	1 0*	—	—
West Rand Cons...	—	—	—	13 0B	—	—
West Rand Estates	4 0B	—	4 0B	4 0B	4 0B	—
Witbank Collieries	—	44 0B	43 0B	43 0B	42 6B	—
Witwatersrands ..	73 0	74 0	73 9B	—	75 0B	75 6B
Wit. Deeps ..	62 6	62 6	61 9B	62 0B	62 9B	62 9B
Wolhuters	15 9B	16 0B	16 0B	16 0B	16 0B	—
Zaaiplaats Tins ..	44 2	44 3B	45 0	45 0	47 0	48 6

B Buyers. S Sellers. * Odd Parcels.

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SEND YOUR TYRES FOR
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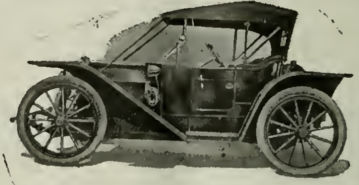

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Add Parsons Non-Skid Chains to your Motor Car equipment and forget what it is to skid or slip. Carry them in your car—ready for instant use. Attached in two minutes, detached in one. Parsons Non-Skids will take you over ANY road surface—sand, mud, grass or rock. They cannot damage or heat the tyres, and they give the maximum tractive grip under all conditions.

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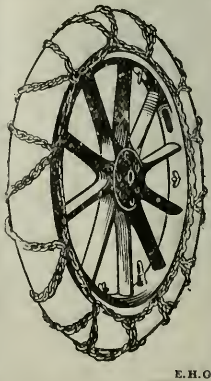

Automobile Notes.

The Fire Brigade Committee of the London County Council proposes to spend during the coming year £13,400 on motor fire-fighting appliances, including six petrol driven engines, eight escape vans, two turn-table ladders and a lorry. Some of the machines are to be obtained with as little delay as possible as they are required for new stations.

* * * *

A law has been passed by the New York legislature which provides that all tyres intended for use on motor vehicles must have "impressed or branded upon the material of which such tyre is constructed, or otherwise indicated by label securely attached thereto," the date of manufacture. The penalty for non-compliance is fixed at £5 for every tyre manufactured. The law which is to come into force on the 1st January next, has not yet received the signature of the Governor, and an endeavour is being made by tyre dealers and the trade generally to get him to veto it.

* * * *

There has been great controversy over rating formulæ in America lately, owing to the proposal of the Commissioner of Motor Vehicles in New Jersey State to devise a rating formula which would give a result approximate to the actual power given off by the motor. The A.L.A.M. formula, which is identical with the R.A.C. formula, has come in for a good deal of condemnation on account of the fact that no cognisance is taken of the stroke factor. Contrary to general expectations, the Society of Automobile Engineers, on being appealed to, passed a resolution in favour of the old system of rating in the following terms: "Resolved that the A.L.A.M. horse-power formula is as good a formula as can

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No. 1. 3/- ea. Takes every Nut from $\frac{3}{16}$ to $\frac{1}{2}$ in.
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Takes 8 Nuts.
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	1	2	3	4	5	6	7	8	9
Price	2/-	2/6	2/9	3/-	3/6	4/6	5/6	6/6	7/6

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Phone 12214 Central
Tel. Add : 'FASNUT,' Central, London.

Supplies can now be obtained at the Stores of the Sole Agents :

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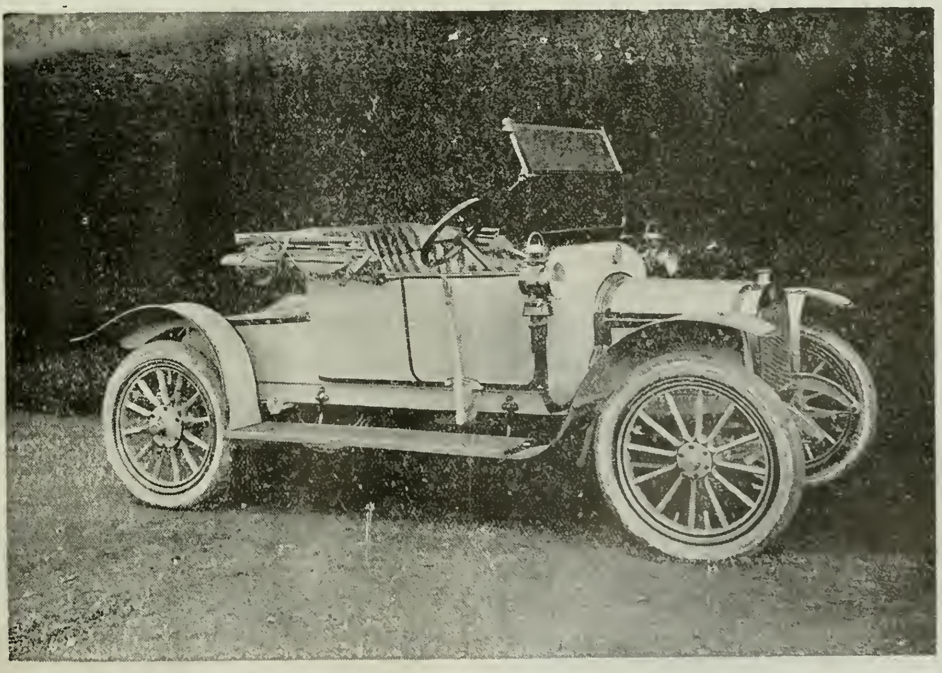
10/14 AUSTIN TWO-SEATER.

AS POWERFUL AS MANY SO-CALLED 15 H.P. CARS



Particulars from **GILL'S GARAGE, Eloff Street, JOHANNESBURG.**
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WHY ALL THIS TALK ?

Results In Use Alone Prove Superiority

ALL THE PRINCIPAL RACES IN 1912 WERE WON ON

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1st Grand Prix de France (957 Miles) on CONTINENTALS
1st Grand Prix de la Sarthe (405 Miles) on CONTINENTALS
1st Grand Prix de Belgique (720 Miles) on CONTINENTALS
1st Monaco Rallye (1,062 Miles) on CONTINENTAL
1st Targa Florio (640 Miles) on CONTINENTALS
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JOHANNESBURG MOTOR SHOW - - STAND 10.

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LONDON. —— HANOVER.

be devised for general purposes, and meets all practical needs in rating gasolene automobile motors in the determination of registration taxation, power developed when travelling on the road, comparison of engine performances by the public."

* * * *

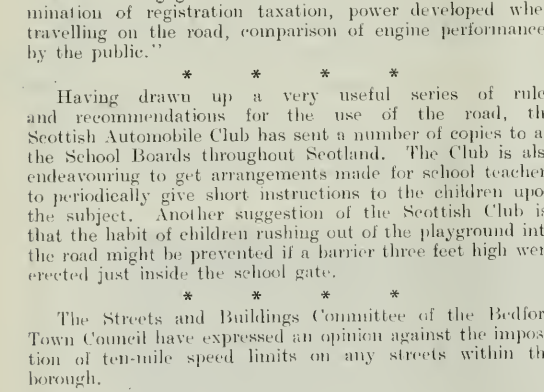
Having drawn up a very useful series of rules and recommendations for the use of the road, the Scottish Automobile Club has sent a number of copies to all the School Boards throughout Scotland. The Club is also endeavouring to get arrangements made for school teachers to periodically give short instructions to the children upon the subject. Another suggestion of the Scottish Club is, that the habit of children rushing out of the playground into the road might be prevented if a barrier three feet high were erected just inside the school gate.

* * * *

The Streets and Buildings Committee of the Bedford Town Council have expressed an opinion against the imposition of ten-mile speed limits on any streets within the borough.

* * * *

In the accident which occurred to the test car in the Victor Tyre Trial, although the car, which weighed two tons, ran up the bank and turned a complete somersault, alighting again upon its wheel, every tyre was intact and apparently uninjured.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Roberts Victor.

The Secretary writes:—I beg to advise you that washing operations, which were suspended on the 19th April, in order to remove reef and prepare for washing larges quantities of ground, were resumed at the Roberts Victor Mine on Monday, the 19th inst.

Witwatersrand Gold Mining Co., Ltd.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

INCREASE OF CAPITAL.

THE following is a summary of a Circular which is being addressed to the Shareholders of the Witwatersrand Gold Mining Company, Limited:—

The Directors of the Witwatersrand Gold Mining Company, Limited, have increased the Capital of the Company from £425,000 to £475,000 by the creation of 50,000 new shares of £1 each. 42,500 of the new Shares will be offered at the price of 70s. each to Shareholders registered on the 7th June, 1913, in the proportion of one new Share for each complete ten old Shares, for which they shall be so registerd. The period for application will terminate on the 15th June, 1913.

The Johannesburg Consolidated Investment Company, Limited, has guaranteed the subscription of the 42,500 shares offered to Shareholders at 70s. each, in consideration of a commission of 5 per cent., to be satisfied by the allotment to that Company of 2,125 new Shares as fully paid. The newly created 44,625 Shares will rank *pari passu* with the old shares of the Company for all future dividends. The balance of 5,375 new Shares will be held in reserve, to be issued at such times and on such terms as the Directors may determine.

The object of increasing the Capital of the Company, as stated above, is in order that, for the future, dividends commensurate with the earnings of the Company may be paid to Shareholders instead of continuing to apply considerable portions of the Company's profits to capital expenditure in connection with the development and opening up of the Southern portion of the Company's property.

By Order of the Board.

JOHANNESBURG CONSOLIDATED INVESTMENT CO., LTD., Secretaries.
per FRANK HALL.

Head Office: Consolidated Building,
(P.O. Box 590), Johannesburg, 23rd May, 1913.

Useful Inventions the Result of Long Study.

A judge before whom many patent cases had been tried, and who spoke from a long experience, observed that of all the inventions which came before his notice the ones which were of use were those which came as the result of long and careful investigation and experimentation by trained investigators and experimenters. Useful inventions are not the result of an inspired moment; they are the result of careful study and patient trial. Inventors who give to the world something of use are not inspired individuals; they are men who know something of the tedium of careful study, of searching investigation, of systematic experimentation.

Bloemhof Diggings: Two Months' Returns.

The official summary of diamonds found and sold in the district for the month of April totals 7,416 carats, value £42,951 9s. 9d. The following fields with several minor areas make up the total:—

	Carats.	Value.		
Bloemhof	1,498½	£9,266	17	6
Koppiesvlei	1,118½	7,310	1	6
Dievedraai	1,124	6,140	10	0
Eastleigh	652½	4,140	12	6
Rietput	371¾	2,397	10	0
London	438½	2,259	5	0
Avondster	350	1,681	17	6
Panfontein	287½	1,515	8	6
Olivenfontein	269½	1,435	0	0
Schweizer Reneke ...	171¾	1,185	3	0
Goedgenoeg	146¼	907	12	6
Mooifontein	141¼	626	3	6
Maroetjesfontein ...	109¾	600	0	0
Christiana	116½	573	16	3
Zwartlaagte	85½	522	7	6
Biestjeslaagte	38½	426	10	0
Modderkraal	73½	335	0	0
Grootdoorns	49½	278	0	0

The month shows a decrease of over £7,000 as compared with the previous month's returns, and is accounted for by the late rains that retarded work for a good many days in April. The March returns were as follows:—

	Carats.	Value.		
Bloemhof	1.900¾	£10.015	19	6
Eastleigh	1,184¼	8,333	0	0
Dievedraai	1,543	7.295	7	6
Koppiesvlei	1,113½	6.499	10	0
London	675	4,069	14	0
Avondster	395½	2,065	7	6
Rietput	354½	1,895	5	0
Olievenfontein	298¾	1,668	3	0
Panfontein	272½	1,272	15	0
Mooifontein	181¼	953	2	0
Schweizer Reneke	122¼	809	15	0
Goedgenoeg	121¾	795	10	0
Modderkraal	130	756	11	0
Kuilfontein	117¾	568	0	0
Grootdoorns	93¾	509	12	6
Maroetjesfontein	76	193	15	0
Zwartlaagte	90¼	123	7	6
Christiana	50¾	309	5	0
Weltevreden	18¾	252	15	0
Biesjeslaagte	16	232	15	0
Blesbokfontein	20¾	114	5	0
Cawood's Hope	12	110	0	0
Vuurfontein	19	108	10	0
Koppiesfontein	6½	52	0	0
Diamantdoorns	7	49	15	0
Kameelkuil	5¾	30	0	0
Doornbult	3¼	27	10	0
Zevenfontein	6½	27	0	0
Middelbosch	7½	19	5	0
Welgevonden	2¼	15	0	0
Kromellenboog	1¼	14	0	0
Mamusa	4	11	0	0
Boschplaats	2¾	8	5	0
	8,917¾	£49.805	19	6

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TELEPHONE 2065.

INVESTORS' DIARY.

The following company meetings have been announced:—

May 27.—Transvaal Coal Trust; Brakpan Mines; Springs Mines; New Era Consolidated.

May 28.—Tudor G.M.; Van Dyk Prop.; Princess Estate; Lancaster West; May Consolidated; Geduld Prop. Mines; Modderfontein Deep Levels, New Rietfontein, Ginsberg, New Primrose, Consolidated Langlaagte, Witwatersrand G.M. Co., New Unified, Van Ryn Deep; Government Areas, Glencairn.

May 29.—Roodepoort United; West Rand Consolidated; Meyer and Charlton; New Goch.

May 30.—Sacke Estates; Aurora West; Cinderella Consolidated; New Steyn Estate; Rand Collieries.

June 3.—Moderfontein B.; Robinson.

June 4.—Rose Deep; Village Deep.

June 5.—Durban Roodepoort Deep; City Deep.

June 6.—Bantjes Consolidated; Geldenhuis Deep; Crown Mines.

June 17.—Transvaal Consolidated Lands.

June 18.—Rand Mines.

June 27.—A. Goerz and Co.

July 1.—General Mining and Finance Corporation.

July 31.—Glynn's Lydenburg (Special).

Aug. 26.—Glynn's Lydenburg (Special).

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's: Holloway Company	8.15
Standard	8.15
Empire	8.15
Palladium	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9

General Mining and Finance Corporation, Limited.

(Incorporated in the Transvaal).

GENERAL MINING BUILDINGS,
Johannesburg, 22nd May, 1913.

NOTICE IS HEREBY GIVEN that the Thirteenth Ordinary General Meeting of Shareholders of the General Mining and Finance Corporation, Limited, will be held in the Board Room, General Mining Building, Johannesburg, on FRIDAY, the 4th day of JULY, 1913, at 11 a.m., for the following purposes:—

1. To receive and consider the Balance Sheet and Profit and Loss Account, and the Directors' and Auditor's Reports for the year ended 31st December, 1912.
2. To elect Directors in place of Geh. Kommerzienrat Eugen Gutmann and Jacob Freudenthal, who retire in terms of the Articles of Association, but who are eligible, and offer themselves for re-election.
3. To appoint an Auditor or Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors.
4. To transact any other business which ought to be transacted at an Ordinary General Meeting.

The Share Transfer Books of the Corporation will be closed as follows:—

(a) At the Head Office from the 30th of June to the 18th of July, 1913, both days inclusive.

(b) In London from the 2nd of June to the 8th of June, 1913, both days inclusive.

Holders of Share Warrants to Bearer desiring to be present or represented at the Meeting should deposit their Shares at the places and within the times following:—

JOHANNESBURG:—At the Head Office of the Corporation, General Mining Buildings, at least three days before the time appointed for the holding of the Meeting; or

LONDON:—At the London Office, (Transfer Department) Winchester House, Old Broad Street, E.C.;

BERLIN: At the Berlin Office, 51, Markgrafenstrasse; at the Dresdner Bank, Behrenstrasse, 38 39; at the Direction der Disconto-Gesellschaft, Behrenstrasse, 43 44; at the firm of S. Bleichroeder, Behrenstrasse, 63; at the A. Schaaffhausen'scher Bankverein, Franzosischestrasse, 53 55

PARIS:—At the Paris Office, 29, Rue Taitbout; at the Bank de l'Union Parisienne, 7, Rue Chauchat;

BASLE:—At the Schweizerische Bankverein;

ZURICH: At the Schweizerische Kreditanstalt:

at least thirty days before the date appointed for the holding of the Meeting.

By Order of the Board.
W. H. BETZ,
Secretary.

APEX MINES, LIMITED.

(Incorporated in the Transvaal.)

DIRECTORS' REPORT

For the Year ended 31st December, 1912.

Submitted at the Sixteenth Ordinary General Meeting of Shareholders, held in the Board Room Fourth Floor, National Bank Buildings, Simmonds Street, Johannesburg, on Wednesday, the 21st day of May, 1913, at 11 a.m.

Gentlemen,—Your Directors beg to submit their Report, together with audited Statements of Account for the year ended 31st December, 1912.

CAPITAL.

The Registered Capital of the Company remains at £300,000, divided into 300,000 shares of a nominal value of £1 each, all issued and fully paid.

PROPERTY.

Your property consists of the freehold of Farm "Rietfontein" No. 11, District Boksburg, in extent 3,577 morgen 67 square roods, which has now been proclaimed and over which you still hold the coal rights. Owners Reservations were secured on proclamation embracing surface rights of 146 morgen 29 square roods.

The Gold Mining Area secured to the Company is as follows:—

Mynpacht, in area...	686 morgen 587 square roods.
Railway Area (leased)...	27 morgen 51 square roods.
Total...	714 morgen 38 square roods.
Equal to	1,028.25 Precious Metal Claims.
To these must be added	87.05 Discovery Claims
Making a total Gold Mining Area equal	1,115.30 Claims.

One Stand in Wolhuter Township has been disposed of to the South African Railways, and the Company now owns 14 Stands, on which is constructed a Railway Siding belonging to the Company.

FINANCIAL.

The financial position of the Company is clearly set forth in the accompanying Balance Sheet.

The net profit from the Coal Section amounted to £37,490; the balance unappropriated from the previous year was £10,207, and the total amount thus available has been treated as follows:—

Dividend No. 16...	£15,000	0	0
Government Tax on Coal Winning Profits ...	2,011	0	0
Directors' Special Remuneration	750	0	0
Balance unappropriated	29,936	0	0
Total	£47,697	0	0

Owing to the exhaustion of Working Capital, it was necessary to suspend operations in the Gold Section on the 25th July, 1912, and since that date only work in connection with pumping and caretaking has been carried on.

Negotiations for the amalgamation of your Company with the Benoni Consolidated Gold Mines, Limited, and the provision of Working Capital, have been proceeding for some time. Owing to the unsettled state of European affairs, no definite result has yet ensued, but your Directors hope that with an improvement in the outlook a suitable scheme will be submitted to Shareholders.

DIVIDENDS.

You are asked to confirm the action of the Board in declaring Interim Dividend No. 16 of 5 per cent., payable to all Shareholders registered on the 20th June, 1912.

In view of the closing down of the Gold Section, as referred to above, no dividend was declared for the half year ended 31st December, 1912, the profits made during that period being allocated towards the cost of keeping the underground workings free of water.

COAL SECTION.

The Reports of the Consulting Engineer and Manager, with the work of the Colliery are attached hereto. It will be seen that the output was 203,198 tons, a decrease of 16,212 tons as compared with last year.

This decrease is due to a falling off in the demand for Springs quality coal, partly caused by a revision of Railway Rates, which was more favourable to collieries situated at a greater distance from the Rand market, and which also adversely affected the selling price.

Your Company continues to hold an Option to lease the Coal Rights of farm "Groenfontein" No. 159, in the District of Middelburg.

Your Company, in conjunction with the other members of the Transvaal Coal Owners' Association, has entered into a fresh agreement with that Association for a further period of five years from the 1st of July next.

GOLD SECTION.

The Reports of the Consulting Engineer and Manager attached hereto deal with the work carried on in this Section during the year.

The net Capital Expenditure on this Section was £72,686, distributed as follows:—

Development	£60,101	0	0
Incline Shaft	4,129	0	0
Underground Conveyors...	7,284	0	0
Pumping Plant	3,871	0	0
Sundries	3,958	0	0
	£79,643	0	0
Less Credit to K.G.C.A. Participation Account...	6,957	0	0
	£72,686	0	0

At the date of suspension of operations the Main Incline Shaft had been sunk a total depth of 2,369 feet. Sinking was suspended at the end of January, 1912, the footage for that month being 174 feet.

At the close of the year the Ore Reserves were as follows:—

	Tons.	Milling Width. Inches.	Milling Value. Dwts.
Payable	196,438	59.37	6.18
Unpayable	96,285	41.96	1.65

DIRECTORS.

In accordance with your Articles of Association, Messrs. G. W. Higgins and J. H. Ryan retire from office. They are eligible and offer themselves for re-election.

AUDITORS.

You are asked to appoint Auditors for the ensuing year and to fix the remuneration of your retiring Auditors, Messrs. F. W. Diamond & English and A. E. Page.

GEO. R. AIRTH, Acting Chairman.
G. W. HIGGINS,
G. C. FITZPATRICK,
J. H. RYAN,
EDW. H. READ, Directors.

Johannesburg, 14th March, 1913.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

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IMPORTANT NOTICE.

NOTICE IS HEREBY GIVEN THAT THE LONDON OFFICE OF THIS JOURNAL, IN SALISBURY HOUSE, HAS BEEN CLOSED. THE ENGLISH AGENCY OF THE PAPER HAS BEEN ENTRUSTED TO THE ARGUS PRINTING AND PUBLISHING COMPANY, LIMITED, BYRON HOUSE, 82-85, FLEET STREET, LONDON, E.C. OVERSEA ADVERTISERS AND SUBSCRIBERS ARE KINDLY REQUESTED TO PAY THEIR ACCOUNTS AND SUBSCRIPTIONS TO THE ARGUS COMPANY, WHO WILL GRANT RECEIPTS ON OUR BEHALF. PAYMENTS MADE TO ANY OTHER PERSON OR PERSONS WILL NOT BE RECOGNISED.

THE LOCAL OFFICES OF THE JOURNAL ARE BEING REMOVED NEXT WEEK TO 176-180, NEW STOCK EXCHANGE BUILDINGS.

Notes and News.

Benoni Consolidated.

At the annual meeting of the Benoni Consolidated, Colonel Dalrymple was able to throw no further light on the possibility of an early restart of operations. He contented himself by repeating what he had said at the Apex meeting last week regarding the general outlook for raising new capital.

* * * *

Blaauwbosch Diamonds.

Prospects of the Blaauwbosch Diamond Mine have improved greatly of late. The quality of diamonds discovered this year is much better than in 1912, and the average price is about double that of last year. It is stated that on the present level a further two years' supply of blue ground is in sight. Another 200 feet is to be sunk in the open pipe, when drives will be made to determine the actual extent of the pipe. It is stated that the present dividend of 80 per cent. will be maintained.

* * * *

The Knights Deep's New Plant.

The two new tube mills for the Knights Deep 400-stamp mill are not yet in commission, but it is expected that they will be brought into operation next month. For the moment the plant is in the transition stage, but in the course of the next week or two the additional equipment will be at work, and the tonnage milled should be greatly augmented. Last month the full battery of 400 heavy stamps, plus nine tube mills, was at work, and there were crushed 101,800 tons. As usual, no waste rock was rejected, and the total recovery was at the low rate of 3½ dwts. per ton. Even on this grade, however, the company earned the substantial profit of £23,039 as a result of the month's operations. Working costs ruled at the very low figure of 10s. 8d. per ton, of which 2d. per ton was on account of development.

Crown Diamonds. Washing operations at the Crown Diamond Mine—the old Lace—will restart in June, and it is anticipated that the yield will average 12½ carats per 100 loads of very good quality stones. The latter are expected to fetch at least 40s. per carat, which is equivalent to a return of 5s. per load. Working costs will average 2s. 6d. per load, so that with the initial quantity of 17,000 loads per month to be washed, a monthly profit of about £2,000 is anticipated. It is understood that the management mean to work up to 30,000 loads per month, which will mean a profit of from £5,000 to £6,000 per month. Worked on this scale, with modern and up-to-date methods and the stones fetching present prices, the prospects for the property are, of course, excellent. The issued capital of the company is £100,000 in £1 shares. The plant is in excellent condition, and it is expected that the sum owing to Messrs. Lewis & Marks will be speedily paid off and the mine placed upon a steady dividend-paying basis.

* * * *

Increasing Stamp Duties. Stamp duties appear to be going steadily up in Transvaal gold mills. The output analysis sheet issued by the Transvaal Chamber of Mines for the month of April shows that the average duty per head per diem last month was 8·85 tons, as against 8·8 tons in March, 8·69 tons in January, and 8·2 tons in April of last year. All the heavier batteries and large tube mill plants are situated on the Witwatersrand and the lighter equipments of the outside districts have a tendency to reduce the average. The duty on the Rand itself was the highest in its history—just under nine tons per day. Taking individual mines, we find the highest duty fell to the credit of the new 100-stamp plus 10 tube mills equipment of the Consolidated Langlaagte, where a duty of exactly 20 tons per diem was recorded. Next on the list is the Roodepoort United Main Reef, where 50 stamps and 3 tubes crushed 26,865 tons in 28·21 days—a duty of 19·05 tons per day. The Modderfontein B. and Robinson Deep mills had duties of over 14 tons per head. As the new equipments of the Van Ryn Deep and Geduld will shortly be brought into commission, it looks as if an average duty of over nine tons per stamp per day would be attained on the Witwatersrand at a very early date.

* * * *

Gold Outputs and Profits: 1913 and 1912. Publication of the output analysis sheet by the Chamber of Mines for the month of April prompts one to institute a few comparisons between the results recorded for the first four months of the current year and the corresponding period of 1912. Although a lesser average number of stamps were in use—9,993 as against 10,041—24 more tube mills were at work, and the tonnage milled in the first four months of this year was 9,223,491, as compared with 8,461,308 in 1912. The total output is substantially greater—£13,163,876 as against £12,782,733—but the recovery per ton is down 28s. 2d. as against 29s. 8d. On the other hand, expenditure per ton has declined from 19s. 1d. to 18s. 1d., and the profit at £4,513,501 is £274,000 better. Unless anything at present unforeseen and unexpected occurs, this year's output should easily constitute a record, and it is, moreover, not unlikely that a fresh standard of achievement will be set up in aggregate profit-earning as well.

* * * *

Zaaiplaats Tin. A quarterly report has been issued by the Zaaiplaats Tin Mining Company for the three months ending in March last, which, in view of the recent attention devoted to this property, will be received with a good deal of interest. The document in question must be adjudged satisfactory, and, taken in conjunction with the generally satisfactory reports as to the latest developments in the mine, should serve once again to establish the value of this prolific producer. The company had its 15-stamp mill at work for 72½ days in the quarter, and crushed 9,294 short tons of ore, the duty per stamp per day being 8½ tons. In addition, 2,174 short tons of accumulated residues were retreated. The output for the quarter amounted to 304½ long tons of concentrates, equivalent to 214·7 tons of metal. The profit for the quarter was estimated at £26,408, and the capital expenditure came to £302.

* * * *

Vacuum Filters and Litigation. Whilst adjustment of difficulties over vacuum filtration and royalties has not been attained, and whilst it still seems that litigation will continue for a lengthy period, it is satisfactory to observe that a spirit of conciliation is gaining ground in some quarters. In Australasia the Moore Filter Company is suing the Talisman Consolidated (New Zealand), and the Lord Nelson in Victoria, while at Kalgoorlie a defence fund has been raised. As to America, we learn that the Moore Company and the Oliver Continuous Filter Company have decided to substitute friendly negotiations for a threatened battle in the courts, and a complete adjustment of all points at issue between these concerns has been reached. While full details have not been made public, it is understood that all questions of infringement as between the two concerns are dropped, and all present users are protected in existing rights. For the future both filters will be sold by each company, and sales are to be upon the basis of the lowest permissible first cost with a tonnage royalty, graduated according to the richness of the ore. Users may commute future royalties on a three-year basis.

* * * *

Magadi Soda. A cable from Mombasa announces that the railway has now been completed to the shore of the Magadi soda lake, and one may accordingly anticipate that at no far distant date production from this remarkable and famous deposit will commence. The Magadi Soda Company is under Messrs. M. Samuel and Co.'s management, and the Central Mining and Investment Corporation are interested in the company to the extent of about £150,000. Speaking at the annual meeting of that corporation, held in London the other day, Mr. Reyersbach remarked that until the railway is through the works at the lake cannot even be started. "How long exactly it is going to take for those works to be erected I do not know—it may be eight, nine, or ten months, so that if some time towards the middle of next year the company joins the soda producers I think that will be about what you can reckon upon. As to the profits that are likely to be made, it is a competitive article, and I think it would be very unwise to give any information on the subject; in fact, I would not do so without the consent of all my colleagues on the board. We know that without some difficulty we are not going to get over the competition which exists in the soda trade, and we should be very ill-advised to disclose either our expected cost figures or what we expect to make per ton. The only thing I can tell you is that the consumption of soda, soda ash, and soda crystals is constantly going up, that the field is a very great one, and that I do not think the portion of the trade which we wish to enter, and which we intend entering, notwithstanding the opposition which we will have to face, will be denied us, but I am not prepared to-day to say what profits we are likely to make, because the balance sheets of the Magadi Soda Company will have to tell that."

* * * *

Bantjes Profits. A return to normal or something closely approaching normal is to be anticipated in the returns of the Bantjes Consolidated Company for the current month. It may be recalled that whereas the March profit was £7,085, the April operations resulted in the earning of a profit of £261 only, although a larger tonnage was milled. As explained in previous issues the very poor result was due to abnormally high working costs, a breakdown in the hoisting arrangements, and the working of an exceptionally poor grade of ore. The poor recovery per ton disclosed in the April operations was not expected to be anything more than a purely temporal and unavoidable fluctuation, and we learn that already the outlook in this regard has improved. A feature of the Bantjes mine is that development has been pushed well ahead, the main incline shaft having been carried down a considerable distance below the lowest level.

* * * *

Anglo-French Exploration.

It was not to be expected that 1912 would prove a good year for the Anglo-French. The directors, however, are able to record "that a moderate amount of profit has been realised, and that the value of the assets of the company shows some increase as compared with the previous year." It may be recalled that for the year 1911 a credit balance of £24,150 was shown in the profit and loss account, after writing off £34,298 in respect of realised losses and sundry other amounts. The profit and loss account for the past year exhibits a credit balance of £47,508, after writing off £5,817 in respect of realised losses. From 1910, a balance of £73,185 was brought forward, and on the present occasion the balance brought in amounts to £67,866, which makes a total sum placed to the credit of the appropriation account for the year 1912 of £115,374. The dividend on the preference shares, which has been regularly paid, absorbed £30,000, and the 6 per cent. on the ordinary shares involves a similar sum. There remains a balance of £50,574 to be carried forward to the accounts for 1913. The directors this year publish a list of the company's securities, among the principal of which may be mentioned 12,500 Apex Mines, 37,000 City Deeps, 7,000 Crown Mines, 145,000 Van Ryn Deeps, 51,200 preference and 54,358 ordinary shares of the Anglo-French (Transvaal) Navigation Coal Estates, and 36,817 shares of the Anglo-French Matabeleland Company.

* * * *

The I.M.M. and a Royal Charter.

The Institution of Mining and Metallurgy has attained its majority, and its present position and record afford the strongest evidence of its usefulness and of the necessity for its existence. In his Presidential Address Mr. Bedford McNeill says:—". . . . We want to extend the scope and to increase the usefulness of our Institution. We want larger offices and increased library and reading-room accommodation; we must have a larger staff to cope with our increasing membership and the technical and detail work of the Institution. Now, are we prepared to make the necessary personal sacrifice? Lord Bacon remarked: 'Every man is a debtor to his profession.' I ask you, do any of us do as much for our profession as our profession does for us?" In addition to the requirements mentioned in the above quotation, the Council are satisfied that the interests of members of the Institution demand increased protection, as also do those of the investing public. It is their intention, therefore, to petition for the grant of a Royal Charter of Incorporation, which, if obtained, would materially strengthen the *status* and powers of the Institution. It is necessary as the first step in this direction, to establish an adequate permanent fund. The Council have therefore decided to ask members to subscribe at least £10,000 for this purpose; and they count upon the whole-hearted co-operation of every member, associate and student to assist them in raising this sum. The late Arthur C. Claudet, who filled the office of Treasurer for twenty-one years, had the furtherance of these objects very much at heart, and it was his intention to submit proposals for giving effect to them in connection with the recent celebration of the 21st anniversary. With the view of perpetuating his memory and in appreciation of his personal services to the Institution and to its members, it has been decided to allocate out of the proposed fund a sum to produce an income sufficient to continue the students' prize, which Mr. Claudet had presented annually for many years, the prize to be known as the "Arthur Claudet Memorial Students' Prize." With the exception of the sum thus allocated, the amount subscribed will be invested as a permanent asset, the income from which will be devoted to the ordinary purposes of the Institution.

TOPICS OF THE WEEK.

THE MINERS' STRIKE AT THE NEW KLEINFONTEIN.

As we go to press there is some reason to hope that the strike of employees at the New Kleinfontein, which has been a regrettable feature of the week, is about to be settled. At any rate, the chairman has come forward, after examining all the facts, and in a letter addressed to the Deputy-Mayor of Benoni, who has been endeavouring to bring about a settlement of the strike, has made what must be regarded as a very fair offer to the men. The dispute originally arose in consequence of the change in the system of the underground work whereby the rearrangement of the hours of work of five underground mechanics was affected. Formerly, these men worked from 7 a.m. to 3.30 p.m., except on Saturdays, when they finished at 12.30 p.m. Under the new arrangement they were asked to work the same hours as the miners, namely, from 7.30 a.m. to 3.30 p.m. every week-day, including Saturdays. This change of hours they declined to accept, stating that it interfered with their Saturday afternoon holiday. The men's pay was not interfered with, nor was it the intention that the hours of work should exceed forty-eight per week. Colonel Dalrymple, in his letter, states: "I must frankly admit it would appear that the details attending the alteration of hours of the men concerned may not have received sufficient consideration, owing to the change of management having only taken place on the 1st of this month, and, therefore, my board, after further consideration, are prepared, in order to meet the wishes of the men concerned, to withdraw the notice posted on the 26th inst., and to revert to the hours in force on the 30th April. It is hoped that this will remove all cause of dispute, and, if so, my company is prepared to reinstate all of its employees." It will be seen that the Chairman admits that the company put itself in the wrong by giving insufficient attention to the men's rights in regard to the alteration of working hours. To that extent the men certainly had a grievance, though their method of showing it may not commend itself. A company, however, of the importance of the New Kleinfontein cannot afford to take precipitate or ill-considered action in such matters, and the officers responsible for the beginning of the trouble will doubtless suffer for their temerity. At the same time the extraordinary sentiments, the threats and wild statements to which the agitators have given voice during the week, can have no justification, and must be reprobated by all sensible men. Even admitting that a dispute of this kind is the agitator's opportunity and sole excuse for existence, the relations between the skilled workers of the Rand and their managers in no way justify the use of the violent and minatory language that has flowed so fast and freely from the strike leaders on the East Rand this week. Their interference may considerably delay a settlement, though the strikers' further demands have yet to be formulated. No one has any desire to exasperbate feeling or accentuate differences at this juncture, but it is difficult to say, in looking back over the events of the past week, whether the stupidity of the mine officers in the first instance or the malevolence displayed by the agitators were the worst features of the whole wretched business.

THE NEW BEWAARPLAATSEN BILL.

Not a moment too soon to save the good name and credit of the country, General Smuts has decided to ignore Mr. Hull's views on the bewaarplaatsen question, and to bring in a Bill apportioning the proceeds on more equitable lines, *i.e.*, equally between the State and freehold owners. A brief message to this effect reached us from Capetown at the beginning of the week, but the full details are still awaited. The subject, it is needless to remind readers, has on many occasions occupied the attention of the House of Assembly, and the papers have from time to time contained innumerable protests against the alleged confiscatory intentions of the Government. Bewaarplaatsen are, of course, reserved places, and in Rand signification denote pieces of ground which in the early mining days were applied for by the mining companies for battery sites, houses, depositing places for tailings, water-rights and other purposes. A Transvaal Act of 1908 provided for the leasing, mining or other disposal of the bewaarplaatsen; and in 1909 a Commission was appointed to enquire and report whether any share of the proceeds derived from the utilisation of the bewaarplaatsen, in accordance with the provisions of the Act of 1908, "should be paid to any class of persons, and, if so, to what class or classes and in what proportion." The Commission consisted of Mr. Ewald Esselen, Mr. Justice Gregorowski, and Mr. H. C. Fleischer. The Commission's report clearly sets down in the concluding paragraph that "registered owners of freehold" in the bewaarplaatsen, of whom at that time there were seventeen, are entitled to receive 50 per cent. of the moneys accruing to the Crown in this connection. So far as the other half is concerned, the Act of 1908 seems to intend in Section 53 that the sums accruing to the Treasurer shall be devoted to the extinction of debt, if the mining is carried on by Government, and shall be paid into a special fund, pending the direction of Parliament, if derived from the lease, or other disposal, of bewaarplaatsen rights to other people. According to Sir Lionel Phillips, however, the freehold owners have not received a penny, while Mr. Hull is stated to have simply included the entire proceeds up to his time in his estimates of general revenue, and he declared in the House that he was against any sharing of the proceeds with the freehold owners. Even from the point of view of the actual amount involved, this is not a trifling matter; for the capital value of the bewaarplaatsen rights is put by Sir Lionel Phillips at something under two millions sterling, an estimate which does not greatly differ from that of Mr. W. Bleloch, who in his work entitled "The New South Africa" puts the value at £1,750,000. The principle involved is, obviously, of much greater importance than the cash, and General Smuts' Bill will therefore be welcomed by the whole industry and by all who are jealous of the credit of the country.

FAR EASTERN RAND PROSPECTS.

The outstanding feature of the speeches made at Rand company meetings this week is the remarkable improvement that has lately been shown in the prospects of the Far Eastern Rand. The Geduld, Springs and Government Areas chairmen were able to make most gratifying pronouncements on the future of this section of the Rand, and to dwell on the remarkable confirmation of former forecasts afforded by recent results. At the Government Areas meeting, Mr. G. Imroth, in seconding the report and accounts, recalled his remarks at the annual meeting of the Johannesburg Consolidated Investment Company in October last, when he ventured to emphasise the growing importance of the Far Eastern Rand, and when he also indicated that they had to look to that district to further expansion and increased profits. The developments which have taken place since then have proved that his previous remarks were quite justified. He instanced the satisfactory profits which were being earned at the New Modderfontein Company, the Modder B., and Brakpan Mines, the improved developments at Geduld, which had led to the enlargement of the reduction plant at that mine, the improved position of the Van Ryn Deep owing to the high values of the recent development, the splendid strike in the Modder Deep shafts, and the satisfactory character of the subsequent development, and finally the encouraging strikes which had been made in the Spring Mines. With regard to the Government Areas, he dwelt on the encouraging development in the northern section of the property, and the excellent strike which was met with recently in the south-east shaft. This strike is of very great significance, and encouraged the directors in the determination to take in hand the rection of a reduction plant. The first section of the plant would not have a capacity commensurate with the vast area of their property, but it would be designed so that it could be easily enlarged to a capacity of 100,000 tons per month or even more. The enlargement of the plant would be taken in hand as soon as sufficient ore is developed to justify it. "Ultimately," added Mr. Imroth, "we look forward to the property becoming one of the main gold producers of the Rand." Mr. Elkan's references to the "good showing" at the Geduld, and Mr. Honnold's to the promise of the Springs Mines, are noted elsewhere. All combine to strengthen the belief that the Far Eastern section will yet prove the salvation of the Rand.

THE "C.M.S." SUBSIDIARIES.

At the annual meetings of the four subsidiary companies of the Consolidated Mines Selection, held this week, Mr. W. L. Honnold was in every case in a position to make most satisfactory statements. Despite its recent troubles, the Brakpan Mines is now rapidly getting into its stride again, and Mr. Honnold anticipates that a few months will see recent disorganisation set right. His explicit statement regarding the recent trouble at the mine and his remarks in regard to future profits and dividends appear elsewhere in this issue, and will, no doubt, be welcomed by the shareholders. It is plain that the position of the mine is as sound as ever, and that the subsidences which have so frightened the market may be taken, in Mr. Honnold's apt term, "philosophically." Even more interesting than the Brakpan meeting was that of the Springs Mines. Mr. Honnold described the results of recent reef strikes, and of the satisfactory financial arrangements made to develop and equip the property. To Colonel Dalrymple, who seconded the adoption of the report and accounts, he left the congenial task of forecasting the future of the mine. From the speeches and reports it is clear that the period of shaft sinking has been a very strenuous one for the management, more particularly since the water difficulties intervened. The company is now reaching the stage when the dead work is nearing completion and exposure of the ore through development is taking place. All the evidence points to the fact that the company has been fortunate in securing what Colonel Dalrymple calls "a highly mineralised area." The formation disclosed in course of sinking the shafts has in each case been very regular. The reef struck in the northern shaft has proved to be a well-defined body of ore, yielding 15 dwts. over 36 inches, and the results from the borehole at the bottom of the south shaft point to the reef being of good width and value, these shafts being 4,300 feet apart. In addition, there is the evidence of the borehole which was put down betwixt the two shafts, giving 21·1 dwts. over 10·81 inches at a depth of 3,620 feet from the surface. "Everything indicates," said Colonel Dalrymple, "that you can proceed with the opening up with the fullest confidence that you should develop a mine of high commercial value. With regard to the financial position, you are to be congratulated in having succeeded in carrying through a financial scheme supplying ample money to open up a large mine. It is true a scheme which necessitates the creation of a debenture issue on a property which is only on the brink of development is open, from the shareholders' point of view, to criticism from several aspects, as it is accompanied by risk; but, in times like these, what could the board do? I think we were wise, rather than run the risk of having to shut down, to take the money on the basis offered. Of course, if a payable mine is not opened up, the shareholders are in a precarious position, and, as a matter of fact, so are the debenture holders; but, with such value as you have had disclosed, I think that you are not taking an undue risk, and if the development, for which purpose this money has been raised, is successful, a very large appreciation in the value of the ordinary shares should result, and the exercising of the options should supply the necessary money for the reduction works." This appears to us a very fair statement of a position, upon which all concerned are to be congratulated. The feature of the Transvaal Coal Trust meeting was the announcement that the De Rietfontein Colliery would be closed down as from June 30 next, though without loss to the company, as the output from the Oogies pit would be increased to make up the loss. The prospecting recently carried on in the Breyten district had not been successful. As is well known, both the Transvaal Coal Trust and the New Era have large holdings in the Brakpan and Springs mines, and the finances of the two first-named have, of course, appreciated considerably by reason of the improved position of the two gold mining companies. It only remains to congratulate the new chairman of the group, Mr. W. L. Honnold, and his co-directors, and his consulting engineer, Mr. C. E. Knecht, on the most satisfactory batch of annual statements that the subsidiaries of the Consolidated Mines Selection have yet produced.

THE MODDERFONTEIN GOVERNMENT AREAS.

A Huge Property with Brilliant Prospects—Erection of First Portion of Mill Decided on.

By reason of its enormous size the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd.—to give what is generally known as the "State Mines" its full cumbersome title—has always been regarded as a prospective producer of the first magnitude and at the annual meeting of the concern held on Wednesday last, both Mr. John Munro and Mr. Gustav Imroth were able to give shareholders confirmation of the generally favourable impressions obtaining regarding this property. The Government Areas on Modderfontein in many ways constitutes a remarkable concern. Not only in so far as its partial State ownership aspect is concerned but on account of its size as well, the property is a noteworthy one and bids fair to make history in Rand gold mining. The company has the lease as from November, 1909, of the exclusive right to mine precious metals upon certain two mining portions of the farm Modderfontein No. 167, and the extent of the area is 2,633 claims. The extent of the mineralised area of the property may be the better realised when it is stated that the distance around its boundaries amounts to no less than ten miles.

Erection of Mill Decided On.

The opening up of such a huge area of mining ground must obviously take much time and call for the expenditure of large sums of capital, but so well has the controlling House—the Johannesburg Consolidated Investment Company—utilised the time that has elapsed since sinking was commenced that already three shafts are on the reef and plans are in course of preparation for the erection of a plant capable of handling 50,000 tons of ore per month. This was perhaps the most interesting and important statement of all made by the chairman at the meeting. There appears to have been in the minds of most people an impression that the date of commencement of crushing on the Modderfontein property would be long delayed inasmuch that the mine is an enormous one and that the reef lies at a considerable depth. To those who have held to this impression Mr. Munro's announcement that if no unforeseen delays occur the mine will be crushing before the end of next year must come as a pleasurable surprise. Indeed, a site for the mill already has been located and orders for the necessary machinery will be placed in the course of the next few months.

Good Development.

The decision immediately to take in hand the erection of a reduction and treatment plant of 600,000 tons per annum capacity has no doubt been largely influenced by the excellent strike recently met with in the south-east shaft. This is situated at a distance of about one mile to the west of the extreme eastern boundary of the property of the Geduld Proprietary Mines and the disclosures in this shaft, as is now generally known, have been entirely satisfactory. Both in regard to width and value the intersection may be characterised as exceptionally encouraging. A small fault cuts across the shaft at some 15 feet from its northern end and this causes an upthrow of the reef of about 11 feet. The reef was first encountered to the south of this fault and the average value of this section works out at 16·8 dwts. over 65·3 inches. To the north of the fault the reef is not quite so thick, and the value is somewhat less, but at the same time it averaged 16·8 dwts. over 15·5 inches. Too much importance should not, of course, be attached to isolated strikes in shafts, but we think Mr. Munro voiced modest anticipations in regard to this section of the property when he stated: "These results are most encouraging and lead to the hope that this section of the property will not only be of good value but will contribute a large tonnage of reef to the mill." Yet another shaft remains to reach the reef—the south-western. It is hoped that the conglomerate body will be encountered here in about two or three months' time. As to the northern shafts it is satisfactory to learn that development at these points is making rapid progress. At the north-west the northern incline has been extended 960 feet and the southern incline 692 feet, and at the north-east the northern incline has reached a distance of 850 feet and the southern 429 feet. Latterly the southern incline has been on reef of good value and Mr. Munro was able to assure shareholders that, taken as a whole, satisfactory values have been exposed in the various development ends.

Further Equipment Contemplated.

The Government, of course, has a large say in the affairs of this concern, and the decision to proceed with the erection of a portion of the reduction works is, naturally, subject to Government approval. It is obviously far from likely that the controllers of State will voice any objections to the early attainment of crushing, inasmuch as the State will benefit greatly by the productive operations of this mine. Of course, a plant of 50,000 tons per month capacity is far from being commensurate with the vast area of the property, and the equipment now to be installed will be designed so that it can be easily enlarged to a capacity of 100,000 tons per month or more. Enlargement of plant will only be justified by the exposure of sufficient ore, but as work is being pushed on from four shafts it should not be a matter of very many months before extension of the mill will be warranted by the position underground. "Ultimately we look forward to the property becoming one of the main gold producers of the Rand," remarked Mr. Imroth on Wednesday. The results of development so far achieved, taken in conjunction with the vast area controlled and the prosperity of adjacent mines assuredly point to a fulfilment of Mr. Imroth's expectation.

RECENT PROGRESS AT THE VAN RYN DEEP.

New Plant Practically Ready—Excellent Underground Developments.

Mr. J. Munro had not much to add to the satisfactory statements contained in the annual report, and which have already appeared in the columns of this journal, at the Van Ryn Deep meeting on Wednesday last. He was, however, able to inform shareholders that, despite delays on account of the late arrival of plant, it is hoped to have the new equipment ready for a trial run in a few weeks' time. Reviewing the position in the mine up to date, the chairman remarked: "For the four months ended 30th April, there have been added to the payable reserves 231,023 milling tons of an average value of 12·54 dwts. There is no reason to think that working costs will be higher at the Van Ryn Deep than the average for the Rand, so that it will be apparent that with the grade we have to deal with there is an ample margin for profit. The company has sufficient funds in hand to meet all the capital expenditure which is now being incurred, so that from the start of milling the profits realised will be available for distribution. With the position of the mine in such a highly satisfactory condition, your directors look forward to the future with great confidence."

SIGNIFICANT DEVELOPMENT FIGURES.

Noteworthy Increases in Footage and Tonnage—March Total over Fifteen Miles.

In our last issue we referred briefly to the increased amount of development carried out in Transvaal gold mines during the current year, as evidenced in the statistics issued by the Union Mines Department. In our last issue, too, we presented a table of the Rand's ore reserves, in which we estimated the total amount of profitable ore developed to be one hundred and ten million tons, and having a total value in gold contents of approximately £150,000,000. The importance of the development aspect of Rand gold mining cannot be exaggerated. A mine without ore reserves is like a house built on the sands or a bank without money, and happily no one can allege against the great industry of the Main Reef series that the position in this respect is anything other than exceptionally sound and strong. The ore reserves are now estimated to be four years ahead of the mills, and the indication afforded in the Mines Department's latest statistical sheet is that the position is at least being maintained. The figures are worthy of careful scrutiny.

The Rand's Showing.

Taking the Witwatersrand area and dealing, first of all, with producing mines, the footage driven, sunk and risen in March may be segregated as follows:—Main drives and crosscuts, 40,536 feet; main shafts, 1,832 feet; other development, 24,595 feet; total, 66,963 feet. Then, as to non-producing mines, there were seven concerns developing, and their figures stand as follows:—Main drives and crosscuts, 3,413 feet; main shafts, 648 feet; other development, 2,227 feet; total, 6,288 feet. This makes a total for the whole Main Reef industry of 73,251 feet. It may be remarked that, in so far as development on non-productive mines is concerned, the figures given relate to the Further East Rand, where new producers may shortly be expected. The 73,251 feet of work carried out with the object of exposing ore or of reaching blocks of ore afterwards to be developed and made available for stoping, may be written down on the credit side of the industry. As against this, ore hoisted and taken out of the mine may be viewed as depletion, and accordingly written on the debit side. A further examination discloses the fact that on producing mines 2,580,205 tons of ore were hoisted before sorting. Another column states, "Tons of waste hoisted 65,153," another "Total tons of rock hoisted 2,645,358," and another "Tons of waste sorted 301,019." The percentage of waste rejected is given as 11·67. It seems a little curious that the mines should have taken the trouble to hoist 65,153 tons of known waste rock. The hauling of large quantities of barren stone in close association with profitable ore is unavoidable, and is, of course, a perfectly understandable operation. But the amount stated in the column headed "Tons of waste hoisted" is not to be confused with the 300,000 odd tons of waste sorted. The greater part of the 65,153 tons would presumably be derived from shafts and development winzes, raises and drives, but one is tempted to enquire why this rock was not utilised underground and employed in forming waste packs. One would imagine that there would be a ready use found for rock of this nature in providing supports for bad hangings. At any rate, the cost of haulage might, one would think, be obviated.

Pilgrims Rest and Other Districts.

Second in importance to the Witwatersrand area in point of magnitude of development carried out during March is the Pilgrims Rest area. Here 5,702 feet of main drives and crosscuts were driven on productive mines, plus 84 feet of other development. Two developing mines carried out 569 feet of main drives and cross-cut footage, 10 feet of main shaft sinking, and 30 feet of other development. The total for the Pilgrims Rest mining area thus stands at:—Main drives and crosscuts, 6,271 feet; main shaft sinking, 10 feet; other development, 114 feet. For the other gold mining districts of the province the totals for both productive and non-productive mines are:—

TOTALS.

	Development.			Average number of Rock Drills in use.	Total tons of Rock hoisted.
	Main drives and cross cuts.	Main shaft sinking.	Other development.		
	feet.	feet.	feet.		
Heidelberg ...	727	242	529	50	27,499
Klerksdorp ...	151	—	356	7	13,602
Ottoshoop ...	4	—	—	—	146
Pretoria ...	—	—	—	—	—
Barberton ...	1,308	48	420	26	25,052
Pietersburg ..	111	10	106	—	2,727
Transvaal totals ...	52,821	2,790	28,347	6,204	2,792,514

Increased Tonnages and Footages.

It is of considerable interest to note the figures under the above headings (a) for the final four months of 1912 and (b) for the first three months of the current year. The figures are as under:—

1912.	Main Drives and cross cuts.	Main Shaft sinking.	Other Development.	Average number of Rock Drills in use.	Total Tons of Rock hoisted.
	feet.	feet.	feet.		
September ...	48,108	3,576	26,572	5,610	2,529,069
October ...	50,931	3,457	27,615	5,614	2,744,909
November ...	50,182	2,976	26,555	5,845	2,659,613
December ...	48,136	2,606	25,367	5,717	2,666,995

For the first three months of this year the totals have been:

January ...	52,557	3,284	27,394	6,178	2,854,067
February ...	47,398	2,429	26,555	6,057	2,564,339
March	52,821	2,790	28,317	6,204	2,792,514

The totals and averages per month arrived at from the above are:—

	Development.	Tons hoisted.
	feet.	
Last four months of 1912 ...	316,081	10,600,586
Average per month	79,020	2,650,146
First three months of 1913 ...	243,575	8,210,920
Average per month	81,192	2,736,973

The outstanding deduction to be gained from the above figures is that, whilst the mills have called for an increasing supply of ore, and hence have brought about an increase in the total tons of rock hoisted this year, there has been at least a corresponding increase in the amount of development achieved. The controllers of the industry, apparently, are determined, and rightly so, that at all costs the development position shall be maintained, and that the vast aggregate of ore in reserve which the mines have built up shall not be encroached on.

West Rand Consolidated.

Revenue £129,203 12s. 6d., or £1 9s. 11·30d. per ton from 86,300 tons milled; cost £104,326 11s., or £1 4s. 2·12d. per ton; profit £24,877 1s. 6d., or 5s. 9·18d. per ton; yield from mill, 18,359·16 ozs., valued at £77,780 15s. 5d., or 18s. 0·31d. per ton; from cyanide, 12,034·21 ozs., valued at £51,181 19s. 1d., or 11s. 10·33d. per ton; sundry revenue, £240 18s.; capital expenditure, £14,699 14s. 8d. The working profit shows a decrease of £1,244 6s. 1d. as compared with the previous quarter. The Battery Reef has been intersected in a crosscut from the Rand "A" shaft (situate about 2,500 feet to the south of the Rand shaft) at a point which approximates to the horizon of the third level of the Rand shaft. The assay value of the first three sections sampled is 6·3 dwts. over an average width of 58 inches.

THE MANAGER AND STAFF OF THE GLENCAIRN MAIN REEF.

Back Row (left to right): V. G. Jarvis, assistant storekeeper; D. Taylor, foreman carpenter; P. G. L. Leeb, assayer; W. Wenman, shift boss; S. C. Smith, foreman fitter; H. E. Pratt, assistant native timekeeper; C. Hatchinson, assistant compound manager; J. Hopkinson, electrician.

Middle Row: J. Terbrugge, compound overseer; G. O. Parry, mine clerk; C. R. Corfield, hospital attendant; J. A. Sullivan, sampler; J. Watcham, white timekeeper; E. B. H Tennant, mine clerk, V R. Filmer, assistant assayer; F. T. Sanders, acting mill foreman; J. Carswell, cyanide foreman; J. Kirkpatrick, shift boss.

Front Row: T. Harrison, foreman blacksmith; E. E. Wellbeloved, storekeeper; J. J. Griffiths, mine captain; J. C. Hamilton, mine secretary; T. C. Bruce, manager; D. Gillespie, resident engineer; G. Andreoli, cyanide overseer; J. P. Johnson, surveyor; D. F. Ogilvie, mill overseer.

Seated on ground in front: G. Smith, junior, native time office.

THE YEAR WITH GOERZ COMPANIES.

Geduld's "Good Showing"—A Prosperous Career Promised for Modder Deep Levels—Princess Estate Makes Steady Progress—"Life" of May Consolidated—Review of History and Position of Lancaster West—Tudor and Van Dyk Still Waiting.

Annual meetings of the mining companies of the Georz group were held this week and full reports of the lengthy speeches made by the chairmen have appeared in the daily papers. The annual reports and balance sheets were in each case very fully reviewed by the chairman and the position of the different properties brought up to date. At the Tudor and Van Dyk general conditions do not yet allow of resumption of operations.

Lancaster West.

Mr. H. Neuhaus presided at the Lancaster West meeting and reviewed the history and position of the property in great detail. *Inter alia*, he said:—

It is clear from the consulting engineer's report that your directors had no other course open to them but to close down the mine. The ore reserves, while still large in quantity, further decreased in value during 1912, so that it was not to be expected that a yield in excess of 20s. 9d. could be obtained. The cash resources of the company were practically exhausted, and it was impossible to raise the money required to reopen the Botha mine in its lower levels, where years ago payable ore had been disclosed, or to prosecute development work in unprospected portion of the property. It was not only that the amount required, namely, a minimum of £30,000, was large, but the level of working costs is at present such as hardly to justify the belief that if this ore were made available and further payable ore were found in its neighbourhood, work could be continued at a profit, while the burden of the debenture issue, needing an annual service of £18,000 until 1919 inclusive, must also not be overlooked. In short, the general outlook at the mine, the development position (and since the amalgamation over £120,000 has been spent on this account), and the fact that during the four months ended 31st December last a loss of £4,797 was made, convinced your directors that it was in the best interests of all parties concerned to close down operations. But though this grave conclusion was come to, I do not think shareholders need entirely despair of the position. Of course, it is impossible to say what the future will bring, but it is not unreasonable to anticipate that, providing the company can hold out until working conditions on the Rand generally show sufficient improvement, it will then be found possible to raise the necessary capital to resume work, particularly in the Botha section, while it is also not out of the question that in course of time one or other of our neighbours may see its way to make an acceptable bid for the property.

Geduld.

At the Geduld meeting Mr. M. G. Elkan was able to speak most reassuringly in regard to the future of the property. The delay in regard to the additional plant is due to the manufacturers, but it should be ready by the end of June. *Inter alia*, Mr. Elkan said:—

You have seen in the manager's report full details of the 1912 development work done, and are, I dare say, as pleased as I am; well, since the close of the year we have not been idle, we have pushed work on energetically, and obtained very satisfactory results. The development in the deepest portion of the mine, on the second and third levels, tributary to No. 2 incline shaft, has opened up a large area of very fine ore, i.e., on the second level a stretch of 2,280 feet along the strike assays 17.1 dwts. over 19.5 inches; on the dip a raise of 1,115 feet assays 12.8 dwts. over 25.8 inches, while a winze sunk below the second level to connect eventually with the third level, which is being driven 1,000 feet below the second level, has been sunk 360 feet, assaying 12.8 dwts. over 18.8 inches. The third level just mentioned has only progressed 220 feet, which show a value of 13.6 dwts. over 47.8 inches. As these 220 feet have been driven in the direction of the winze mentioned as coming down from the second level, and, as the raise and winze have progressed together 1,475 feet, assaying 18.5 dwts. over 24.1 inches, there is every reason to assume that the good values so far exposed will continue for the 610 feet remaining to be sunk before the connection between the second and third levels is completed. The No. 2 A level off the south drive, which has gone 115 feet, gives 11.3 dwts. over 28.9 inches. The No 1. south raise off the same drive has been risen 185 feet, giving 11.2 dwts over 27.5 inches, and the intermediate drive from No. 1 south raise shows 7.3 dwts over 12.6 inches for 190 feet. Turning to quite another portion of the mine, to the B level No. 3 raise, which progresses in the direction of Modder B, 255 feet raised give a value of 11.2 dwts. over 21.7 inches. Again going further south, i.e., in the direction of No. 3 shaft, we have a winze down 125 feet, being the No. 2 A south winze off the main south drive, giving 7 dwts. I have now given you results from all over the mine, and you will admit that it is a good showing, but we should have done better if our old enemy, water, had not interfered with our progress, and, though long acquaintance makes me face him with perfect equanimity, I take good care to watch him carefully so as not to be caught napping. What the results have been for last year the reports and accounts have shown you, and, as the monthly profits shown lately were lower, I wish to explain to you that this is mainly the result of getting the mine ready for the enlarged plant, which calls for a much larger production of development rock of very low value—in consequence of having to put in wide drives, etc.—than we mine in ordinary times, and, though all absolutely unpayable rock is eliminated, a considerable percentage of very low valued stuff is certainly going through the mill, naturally affecting the results. However, we shall very soon now get beyond this preparatory stage. The water troubles mentioned have also had something to do with the decline in profits. In 1912 the average monthly pumping charges amounted to £1,800; this year, so far, they are £2,200, but they are on the down grade, and in April had been reduced to £1,970. You will please bear in mind also that, when we do change over, there will be besides the customary heavy gold absorption by the plates and tube mills, a stoppage of the reduction works for a few days, the best part of a week, and that is bound to affect the returns for a couple of months, so please do not get nervous when there is no cause.

Modder Deep Levels.

Mr. H. Neuhaus presided at the Modder Deep Levels meeting and summed up the position as follows:—

It would be the easiest matter in the world for me to indulge in detailed prophecies as to the future, but, as we all know, it is never safe to prophesy. Therefore I do not propose to go any further except to say that from all indications we are to be congratulated on being shareholders in a company likely to have a most prosperous career; indeed, as much can be gathered from the remarks of your very cautious consulting engineer in his report under date of the 15th February. Let me now turn to the cash position. From the report before you you will see that at the end of 1912 the balance of cash and cash assets still available was £91,927; since then a further £41,346 has been spent, so that this amount had been reduced to £50,581 at the end of April last, and it is estimated that this sum will suffice to continue work for several months longer. The question of providing further working capital is receiving the serious consideration of your directors. Though, as I have already stated, the reef was 250 feet deeper in the shaft than had been anticipated, and the expenditure on machinery and plant during the present stage of the company's career has exceeded the estimate (chiefly owing to the necessity of providing more compressor capacity than had been expected would be necessary, which, again, is due to the big reef bodies met with and the speed of development, both, of course, very favourable factors), the total expenditure of what may be called the first stage will hardly, if at all, exceed the original estimate. Your technical staff is now engaged in considering the nature and size of the reduction plant to be put up.

Princess Estate.

At the Princess Estate meeting Mr. M. G. Elkan said, *inter alia*:—

As five months of this year have nearly elapsed, I feel I should bring the information in your hands up to date, and it pleases me to be able to state that the progress has been fairly steady. While the working profit in December, 1912, amounted to about £1,500, it has since been steadily increased, amounting in January to about £1,700, February £1,650, March £1,900 and April £2,000. The increase in the tonnage milled is very satisfactory, and the plant is handling a greater tonnage than was anticipated; in March this year we milled nearly 23,000 tons, but fell back just about 1,000 tons in April, due to stoppages in the central shaft to effect necessary repairs; I anticipate for May again a tonnage of 22,000 tons. This central shaft calls at all times for a good deal of repair work and expense; it requires very careful watching due to the shifting nature of the ground, and we cannot hope ever to get it into a perfect condition, which would allow doing away with the heavy item of repairs. Till our west section shaft has been deepened to the level of the present workings of the central section and the necessary connection driven we have to rely mainly on the central shaft, but I trust that it will later on be possible to relieve it somewhat. It is on account of the shaft trouble that I do not anticipate that we shall be able for the present to go beyond an outside monthly tonnage of, say, 23,000 tons, and I shall as a matter of fact be pleased if we can attain that figure. It affords me particular pleasure to direct your attention to the highly satisfactory results obtained in our reduction works, and I would refer you for details to the manager's report; but to bring the information up to the end of last month I may say the actual extraction figure obtained for the past four months is 96.63 per cent., and the residue value 0.167 dwts. per ton; I am satisfied that you will agree with me that an extraction as shown can hardly be improved on, at least not on economical lines.

May Consolidated.

The May Consolidated recently bought 15,000 shares of the Modderfontein Deep in the open market at a cost of £29,064, or approximately 38s. 9d. per share. It is intended that the May Consolidated shall take an interest in the provision of further capital, though it is not proposed that by any means all its funds shall be absorbed by this new enterprise, the intention being to continue for the present to declare small dividends. The May Consolidated Company had at the end of April an excess of cash assets over liabilities of £30,241, in addition to 15,000 Modder Deep shares. In regard to the life of the May, Mr. H. Neuhaus at the annual meeting said:—

> You will not be disappointed by the report under discussion, for when last we met, estimates were put forward according to which the company should have ceased profitable production by the end of the first quarter of this year, so that the estimate above mentioned implies a still further prolongation of the life of the company by some nine months, and I, personally, should not be surprised if we were able to go on even a few months beyond that period, but I cannot foreshadow what profits we shall earn during the remainder of our existence. I wish to call your attention, too, to the fact that during 1912 some further prospecting was done north of the main reef series, which, however, was entirely unsuccessful. As a result of this work and of similar work undertaken in previous years, your consulting engineer reports that it can now be said that there are no possibilities of finding payable reefs on the property other than those now being worked.

THE FUTURE OF THE WITWATERSRAND G.M. CO.

Increase of Capital—A Sound Financial Scheme—Good Developments in the Southern Section.

The Witwatersrand Gold Mining Company is circularising shareholders on the subject of the increase of capital. The scheme should certainly commend itself to them, as it is a thoroughly sound piece of financing and is in order that for future dividends commensurate with the earnings of the company may be paid to shareholders. In the past considerable portions of the company's profit have been spent on capital account and dividends accordingly have been reduced on this account.

Heavy Capital Expenditure.

Last year the company earned a working profit of £210,750, plus sundry revenue amounting to £20,644, and paid out in dividends £148,750. For the first three months of the current year a gross profit of £67,810 was earned and out of this £8,587 were paid away on capital account, the amount expended on shaft sinking and equipment of the southern section being £7,062. It may be recalled that in the last annual report the consulting engineer, Professor J. G. Lawn, wrote:—Capital expenditure on the mine has been a heavy item during the past two years. This was unavoidable on account of the opening up of the southern section. The additions to the reduction plant outlined above, together with the equipment and sinking of the south incline from the vertical shaft, will necessitate the expenditure of a considerable sum of money during the current year, but in 1914 capital expenditure should be considerably reduced, and the bulk of the large profits being realised should be available for distribution as dividends. It was also stated that in view of the satisfactory position underground, it has been decided to proceed with the installation of five tube mills with the necessary extension to the slime plant. By this means it will be possible to reduce the value of the residues and also increase the tonnage crushed. The work is now in hand, and when the plant is put into operation there is every reason to anticipate a further improvement in the profits.

The New Scheme.

The essential features of the new financial scheme are: (1) The capital of the company has been increased from £425,000 to £475,000 by the creation of 50,000 new shares of a nominal value of £1 each. (2) Of the new shares, 42,500 will be offered at the price of 70s. each to shareholders registered in the books of the company on June 7th, 1913, in the proportion of one new share for each complete ten old shares for which they shall be so registered. The period for application of these rights will terminate on June 15th, 1913. (3) The Johannesburg Consolidated Investment Company, Ltd., has guaranteed the subscription of the 42,500 shares offered to shareholders at 70s. each, in consideration of a commission of 5 per cent., to be satisfied by the allotment to that company of 2,125 new shares as fully paid. The newly created 44,625 shares will rank *pari passu* with the old shares of the company for all future dividends. The balance of 5,375 new shares will be held in reserve, to be issued at such times and on such terms as the directors may determine.

The Underground Position.

The "Knights" mine, whilst it has been a consistent producer and dividend payer for many years past, has still a long lease of life before it in regard to the southern portion of the area. The bottom portion of this T piece has on exploitation given very satisfactory results and with the new plant in operation and encumbrances to the payment of representative dividends removed shareholders should soon be in receipt of substantially larger distributions than heretofore. It may be worth recalling that in the vertical shaft the reef series was intersected in October last. The South Reef was encountered at a depth of 2,232 feet, and assayed 3·15 dwts. over 67·3 inches. At 2,213 feet, the Main Reef Leader was encountered, its assay value being 2·38 dwts. over 9·4 inches. It will be seen that the values are below the pay limit, and more recent development has shown that they are not a correct indication of the average value of the reef in this neighbourhood. The remainder of the year was occupied in cutting a station and sump, and driving on reef was not started until near the end of January. During the March quarter the second west drive at the vertical shaft was extended 146 feet in reef of good value. Last year development operations were directed mainly to the southern section of the mine, and large bodies of payable ore were exposed at the plane of the thirteenth and fourteenth levels. A number of small dykes caused a displacement of the strata in the vicinity of the thirteenth level, with the result that the reef was found to be triplicated, and three separate levels had to be driven at the same horizon. The sinking of the northern incline shaft was discontinued some distance below the fourteenth level. It is not intended to sink the shaft further, as the ground below this point can be more cheaply opened up by means of a cross-cut from the vertical shaft. At the annual meeting of the company, held on Wednesday last, the chairman dealt at some length with the new financial scheme and with the generally satisfactory position of the property.

Rooiberg Minerals Development Co.

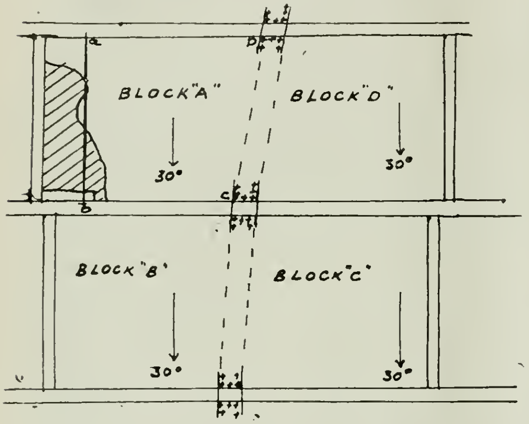
The following are particulars in regard to the operations on the Rooiberg Company's property for the month of April:—Stamps, 10; days run, 28·592; tons milled, 2,929 short tons; concentrates, 98 long tons; average assay value metallic tin, 69·95 per cent.; estimated profit, £7,608 14s. 3d.; adjustments in respect of previous shipments due to fluctuations in the price of tin, to be added, £161 3s. 4d.; profit for month, £7,769 17s. 7d.; net capital expenditure, £240 18s. 5d. The concentrates in reserve at the 30th April amounted to 17·33 long tons (2,240 lbs.), of the net value of £1,616. £2,636 14s. 7d. has been included in working costs for the month in respect of shaft sinking, exploration and mine development. Tonnage milled includes 1,108 short tons sands retreated.

MINE SAMPLING AND ORE VALUATION, WITH SPECIAL REFERENCE TO THE WITWATERSRAND AREA.—VI.

[By Arthur S. Lejeune.]

Chapter V.—The Calculation of Ore Reserves.

By the ore reserves of a mine is understood the amount of available ore, or in other words, the amount of ore which is sufficiently developed for exploitation. Ore reserves are usually calculated in blocks, the size and shape of which is determined by the conditions prevailing in the area over which ore reserves are calculated. For example, let it be assumed that the ore body in a mine is as shown in the following sketch:—



The blocks then might be considered as shown at A, B, C and D. There is, however, an alternative method: Suppose the two dykes as shown are of inconsiderable size and the values on both sides of them are of more or less the same value, then provided there is no big throw the blocks might be grouped together as A and D = one block and B and C = one block. In this instance it would be necessary to deduct a certain percentage of the tonnage to allow for the loss of ore due to the presence of these dykes. It should be mentioned here that it is impossible to lay down hard and fast rules for the calculation of ore reserves. A great deal must be left to the discretion of the individual and anyone who tries to lay down any more than general principles is attempting the impossible. In calculating the tonnages of the ore reserves of a mine it must be borne in mind that an allowance must be made for pillars and lost ground due to faults, etc. Further, in calculating the tonnage of a block, the ground already stoped out must be deducted. Referring to our sketch: the ground shown cross hatched is stoped ground, and therefore the available ore reserves in this block are indicated by the portion unhatched. The first thing to be done is to calculate the area of the block of ground. This may be done in two ways:—(1) By means of the planimeter. This is by far the more accurate method as will be seen when reference is made to the second method. The planimeter is run round the outlines of the block and so the area is obtained. It must be borne in mind that, as all mine plans are shown as a horizontal projection, the area obtained is the area of that horizontal projection and not the area on the plane of the reef which is the area required. To obtain the area on the plane of the reef multiply the horizontal area by the secant of the angle of dip. Thus area of block A = area (horizontal) × sec. 30° = horizontal area × 1·1547. The objection raised to this method is that the dip is a very difficult figure to obtain accurately and it is held that this is a great source of error. (2) This method does away with the necessity of multiplying by the secant of an angle and is performed as follows: A line a, b, fig. 1, is drawn through the stoped portion in such a way that as far as possible as much stoped ground is included as virgin ground is excluded, that is to say, that the hatched portion on the right hand side of the line is as nearly as possible equal in area to the unhatched portion on the left of the line. This means then that the portion a, b, c, d, is equal in area, or approximately so, to the actual area of the block. Then the length of the two drive portions are added together and divided by two to give the average length of the block. It might here be mentioned that if the drives between a and d, and between b and c, had been very tortuous, a straight line would have been drawn as before to average this. The average length obtained as above is then multiplied by the length of the backs. The back of a block of ground is the length between the top and bottom line measured at right angles to the strike and on the plane of the reef. The consequence of thus multiplying length by backs is to obtain at once an area on the plane of the reef. The next point is to obtain the tonnage. For this purpose an average stoping width must be worked out and the method of doing this has already been shown but is here explained once more:—Suppose (1) the average width along a, d, to be 42 inches; (2) the average stoping width along b, c, to be 50 inches; (3) the average stoping width of the stoped ground to be 60 inches; (4) the length of a d to be 150 feet; (5) the length of b, c, to be 90 feet; (6) the length of backs to be 120 feet. Then to obtain the average stoping width proceed as follows:—Length 150, width 42, length × width 6,300; length 90, width 50, length × width 4,500; length 120, width 60, length × width 7,200; total length 360, total length × width 18,000; an average width equal to $\frac{18{,}000}{360}$ = 50 inches. Now to obtain the tonnage multiply the area by the average stoping widths and divide by the number of cubic feet of ground to the ton. This latter figure on the Witwatersrand is 12. The tonnage in our block then is $\frac{150 + 90}{2} \times \frac{120 \times 50}{12 \times 12} = \frac{120 \times 120 \times 50}{12 \times 12} =$ 5,000 tons. It will be seen from a consideration of the above that the stoping width has been reduced to feet, as the lengths and the widths are not otherwise commensurable. In the first method of working the result is arrived at in exactly the same way except that there is no necessity to calculate the area thus, as the planimeter reading multiplied by the secant of the dip gives the area direct. The formula for calculating the tonnage then becomes

$$\frac{\text{Planimeter reading} \times \text{secant of dip} \times 50}{12 \times 12} = \text{tonnage.}$$

Now having calculated the tonnage it is necessary to obtain the average value of the block, and this is obtained by averaging the drive values with the stope values. Referring to our sketch (block A): suppose the average value along the drive on the first level between a and d is 6·0 dwts. and along b, c, on the second level is 5·0 dwts., and suppose the value of the stoped ground to be 4·8 dwts., then the average value of the block will be found as follows:—Length 150 × value 6·0 = length × value 900; length 90 × value 5·0 = length × value 450; length 120 × value 4·8 = length × value 576; total length 360, total length × value 1,926. Average value equals $\frac{1{,}926}{360}$ = 5·35 dwts. Now it has been shown how to calculate the tonnage, the average stoping width, and the average value, it remains to show how several blocks are averaged together. This is best explained by a table as follows:—

All Day Gold Mining Company, Ltd.
Main Reef Ore Reserves.

Block No.	Tons.	Stoping width.	Tons. Stoping width.	Value.	Gold Contents.
1	2000	60″	33·3	6·0	12000
2	5500	50″	110·0	5·2	28600
3	1600	48″	33·3	3·6	5760
4	12500	52″	240·4	7·2	90000
5	6200	71″	87·3	6·1	37820
6	4800	80″	60·0	10·5	50400
7	1900	46″	41·3	5·2	9880
8	7100	53″	134·0	6·3	44730
9	21000	70″	300·0	8·2	172200
10	850	45″	18·9	7·1	6035
11	6500	65″	100·0	5·6	36400
12	1200	60″	20·0	4·8	5760
13	2300	50″	46·0	4·5	10350
14	1500	42″	35·7	12·1	18150
15	3100	41″	75·6	7·5	23250
Totals and Averages	78050	58·4″	1335·8	7·06	551335

Explanation of the foregoing table:—As will be seen the tonnage of each block is divided by its stoping width and a quantity Tons/S.W. is obtained. It is necessary to explain this step, as hitherto we have multiplied the S.W. by a factor. The reason for the division here is that by so doing a commensurate figure is obtained which could be expressed as an area, whereas if these two terms had been multiplied a solid of four dimensions would have resulted and this is an impossible thing. It would be well to mention that discussion on this point has been very heated, and it is only after considerable argument that this method has now been accepted as correct. The tons are now multiplied by the dwts., giving the gold contents. To obtain the average stoping width divide the total tons by the total Tons/S.W. This gives us the required figure according to the following formula:—Tons divided by $\frac{\text{Tons}}{\text{S.W.}}$ = tons × $\frac{\text{S.W.}}{\text{Tons}}$ = S.W. Further, by dividing the gold contents by the tons the average stoping value is arrived at. Another method of finding the average stoping width and one which does away with all discussion as to the advisability of dividing or multiplying the tons by the stoping width is as follows.—Add together the areas of the different blocks and divide the total area into the tons. The result must then be multiplied by the number of cubic feet of ore to the ton. On the Witwatersrand this would be 12. Thus:—Tons = $\frac{\text{Area} \times \text{S.W.}}{12}$

$$\therefore \text{S.W.} = \frac{\text{Tons} \times 12}{\text{Area}}.$$

Allowance for Lost Ground.—It will be fully realised that a certain amount of ground in a mine is unexploitable. This may be due to ground which has to be left as safety pillars or loss of ground due to faulting and broken ground. The amount of ground which should be considered as lost depends wholly on the nature of the occurrence, *e.g.*, in a very faulted zone a larger allowance must be made than in a little faulted region. The figure usually taken on the Witwatersrand gold fields under normal conditions is 10 per cent. of the total tonnage. But the better method is probably to run the blocks up to the dykes or faults on both sides and then to deduct 5 per cent. for pillars. This really means that no faults or dykes are included in blocks and thus only an allowance for pillars is necessary. In connection with the foregoing it should be mentioned that a block may sometimes be considered as fully developed even though connections are not actually effected, provided that these connections are nearly put through. This means that a block bounded by two drives and two raises and winzes which are nearly connected may be considered as fully developed and treated as if the connections had actually been effected

(To be continued.)

NEW PRIMROSE PROSPECTS.

Reduced Costs—The Life of the Mine —Effect of Tube Mill Plant.

"The outstanding feature on this mine," remarked Mr. Munro, at the annual meeting of this company held on Wednesday, "has been the steady reduction in working costs, which are practically 1s. per ton lower than the previous year. There has been a further slight reduction in working costs during the first four months of 1913, and the average monthly profit for this period is higher than that for 1912." Mr. Munro added:—

The development which has taken place has been directed principally to the opening up of the southern series, and of a section of the main reef on the western side of the mine. In this latter part ore of satisfactory grade was expected, and in the former small quantities of payable ore have been added to the reserves. Another feature of the operations is that quite a large percentage of the ore mined was obtained from reclamation. As is usual with the mines of the group, the ore reserves were re-estimated at the end of the year, and the payable tonnage was calculated to amount to 413,033 milling tons of an estimated recovery value of 6.5 dwts. The mine is now getting the benefit of the tube mill plant, and in April the average value of the residues only amounted to .258 dwt. This figure, when compared with the average value for 1912, viz., .559 dwt., shows a direct gain to the mine of one shilling and threepence on every ton of ore milled. Every improvement in this direction helps to lengthen the life of the mine by permitting us to handle lower grade ore at a profit. It is difficult, of course, to say with certainty how long the present high rate of profits will be maintained, but from all the information available, it would appear that there are still several years ahead of us during which good profits will be realised.

POSITION OF THE NEW RIETFONTEIN.

The Year's Development—Re-estimation of Ore Reserves.

At the annual meeting of the New Rietfontein Estate Company, held on Wednesday, Mr. Munro, who presided, made some interesting remarks in regard to the development of that property. He said:—

I would draw your attention to the consulting engineer's remarks in connection with the development carried out during the year in that portion of the mine served by No. 1 shaft, in which section a large area to the south of the present workings has still to be opened up. Although good values have been met in the 12th and 13th levels, the ground is so much disturbed that only a comparatively small tonnage of payable ore has been developed by the work so far accomplished. It is hoped, however, that further south the formation will be more regular, and shaft-sinking is being carried on with the view of proving this ground. Careful attention is also being devoted to the central portion of your property, and it is anticipated that a large quantity of payable ore will be mined from this section. It is to be regretted that the borehole, which was put down to the south of the large dyke, passed out of the Witwatersrand quartzite at a depth of 3,068 feet without intersecting the reef, and no further attempts have been made to ascertain its position south of the dyke. Owing to the fact that several blocks of ground which had been included in the payable ore reserves of last year, proving on opening up to be below the pay limit, a careful re-estimation of the ore reserves was necessary. This re-estimation shows that the payable reserves at December 31 amounted to 135,887 milling tons of an estimated value of 6.5 dwts. There are also developed in the mine 260,214 milling tons of uncertain value, and assuming that 50 per cent. of this rock should prove to be payable, the total ore reserves would amount to 265,594 tons.

THE POSITION AND PROSPECTS OF THE BRAKPAN MINES.

Recent Development—Stope Subsidence Troubles—Dividend Outlook.

At the annual meeting of the Brakpan Mines this week, the chairman, Mr. W. L. Honnold, having reviewed the returns for 1912 at length, added the following informing statement in regard to the position of the mine and the dividend outlook. He said:—

Broadly speaking, there is no change in the development position inconsistent with the recognised character of the mine. It is true that, taking the payable and unpayable together, the tenour of this year's development has so far been below that of last year. This, however, may be regarded as but an incidental phase of no immediate significance apart from its adverse influence on current recovery; for, as you know, the reef is not continuously of profitable grade, and in driving from one payable area to another it is necessary to go through unpayable ground. Furthermore, the payable areas themselves are of different and varying grade. It is inevitable, therefore, and quite in accord with our past experience, that the average of development assays should fluctuate from time to time, as well as the showing of any particular portion of the mine. Two dividends were declared during the year, No. 1 and No. 2, of 15 per cent. and 25 per cent. respectively, involving a distribution of £300,000 to shareholders. You will be asked later on to confirm the Board's action in this connection. The question of the next dividend has not yet been considered by the Board, and will not be brought forward until the actual position for the half-year has been more clearly defined. I candidly confess that I deprecate the acceptance of a previous dividend as a standard to be struggled for regardless of intervening circumstances. It has to be recognised, however, that the recent dislocation of operations may have proved so disconcerting to some of our shareholders as to call for a word of reassurance. I therefore venture to say that I see no reason for anticipating less than 20 per cent. in June. It may be possible to pay a higher rate without encroaching upon the balance brought forward from last year, but even if I were sure of this I would prefer to keep the way open for the Board to follow a conservative course. As to the balance of £51,090 carried forward, I may say that it is in no sense earmarked, and that the Board feels at liberty to increase or decrease it from time to time as may seem advisable in the light of circumstances. The native labour supply improved during the year, and on the whole was equal to our requirements. With the formation of the Native Recruiting Corporation the previously prevalent cut throat policy of the groups as to recruiting disappeared. The new organisation has fully met expectations and will no doubt prove more satisfactory to the native, as well as result in a reduced cost of recruiting. The recruiting organisation of the Consolidated Mines Selection Company, which served your company so well in the past, is being liquidated, and will no longer appear in our financial statements. With regard to the bearing on our operations of the Government's decision to stop the recruiting of tropical natives, it is too soon to express an opinion. All I can do to-day is to point out that the mine is on an exclusive machine-mining basis, and is provided with other mechanical appliances which ensure us certain advantages in the event of labour shortage. I am glad to be able to tell you that the recent interference with operations is in the way of early correction. The trouble, as you know, arose through an unusual subsidence of hanging wall in some of our most important stopes. To avoid possible misconception I will explain that roof subsidence in itself is a matter of no special concern, in fact it is an essential feature of our system of mining, and has occurred from time to time almost from the beginning. As a rule it takes place more or less in accordance with expectations and without material inconvenience. In this instance, however, the stopes concerned were particularly large, and, furthermore, were closely adjacent. The movement, therefore, was much more extended than usual, and not only blocked the faces at a number of points, but also covered some of the stope tracks. The consequent disorganisation has been greater than was at first anticipated, and earnings have suffered accordingly. It would be wrong, however, to take the reduction in profits as a measure of the significance of subsidence. In all probability the management would have experienced little inconvenience, and there would have been but a comparatively small curtailment of profit—in fact, the matter would perhaps not have been heard of—if the stopes concerned had remained intact only a few months longer, or until others, now in course of opening, were ready to supply an equivalent tonnage. It is really because of the inopportuneness of the incident that its bearing has been so unduly distorted. In other words, we have experienced a bit of bad luck which, I am sure you will agree, it would have been ungracious to take other than philosophically in view of our previous record of steady progress. It seems unnecessary to say more in this connection, except to assure you that the stopes are again in stable condition, although on a curtailed basis of output, and that we do not expect a recurrence of similar trouble. The mine is gradually getting into its stride again, and this month will show an improvement in results, the probability being that above 56,000 tons will be milled of a grade somewhat better than last month. Next month we shall still be handicapped by the recent disorganisation, and for this reason, as well as because of its being a short month, may not show much advancement. After the middle of the year, however, we expect further improvement, for the new stopes now being opened will begin to exert a favourable influence. Obviously I cannot be expected to speak more definitely, as results will be dependent on the bearing from time to time of the various and varying factors I have endeavoured to make clear.

CONSOLIDATED LANGLAAGTE PROSPECTS.

Excellent Results from the New Plant—A Dividend to be Paid Shortly—Finances Explained.

At the meeting of the Consolidated Langlaagte Mines, held on Wednesday, Mr. J. Munro, who presided, referred to the high efficiency of the new plant, and made the interesting announcement that the company would soon enter the dividend paying list. He remarked:—

The mill is now being run at its full capacity, and the results which we were led to anticipate are being realised. A certain amount of sorting is being accomplished, and it is hoped by increasing the percentage of waste picked out still further to improve the grade. An excellent feature of the new plant is the low value of the residues and the consequent high percentage of extraction which has been attained. For the month of April the average value of the residues was returned at .218 dwt., or, in other words, the crushed ore after undergoing its final treatment only contained gold to the value of 11d. per ton. Now that mining operations are being carried on at the southern section, there are four shafts on the mine through which rock is hoisted. The operation of all four shafts has a tendency unduly to increase working costs, and a scheme is being considered which will permit of all rock broken being hoisted through the two vertical shafts and thus enable the steaming stations at the outcrop shafts to be closed down. Now that the mine is amply developed and the new reduction works completed, the time is opportune to take in hand the readjustment of our finances. You will have seen from an advertisement appearing in the newspapers that a special meeting will be held immediately after the close of this one to consider a proposal for the raising of a debenture issue of £300,000 in order that the profits which have hitherto been devoted to the development and equipment of the property should be made available for distribution to shareholders. Since the reconstruction of the company in 1908, profits have been earned amounting to £550,000, and at the end of last month an amount of £509,375 9s. was due to the Johannesburg Consolidated Investment Company, Ltd., under an arrangement with that institution to finance the company in the scheme of opening up and thoroughly equipping the large area of your property south of the Ferreira-Crown dyke and redeeming the debenture issue of £250,000 outstanding when the company was reconstructed. The Johannesburg Consolidated Investment Company have exercised their option over the 217,321 shares under option to them until November 6 next, and will take them up before June 30. The new issue of debentures now recommended and the cash received for the shares will place the company in the position to entirely liquidate its floating debt, and leave a substantial balance towards the dividend, which I confidently anticipate will be paid at the end of this year.

South African Mining Journal

REMOVAL OF OFFICES.

From and after the 1st JUNE next the Offices of the SOUTH AFRICAN MINING JOURNAL will be situated at Nos. 176 to 180, STOCK EXCHANGE BUILDINGS, Fox Street, Johannesburg—(2nd Floor).

Rhodesian Section.

LATEST MINING NEWS.

Position at the Eldorado—Abercorn Activity—A Report from the Lonely—Matabele Queens—Cam and Motor—The Globe and Phoenix Company's Year.—The April Output.

The Goldfields Rhodesian Development Co., Ltd., the secretaries of the Eldorado Banket Gold Mining Co., Ltd., issued a circular in London under date 24th April, 1913. This circular reads as under:—In consequence of rumours that the main shaft at the mine has caved in, the board at its meeting to-day authorized me to inform you that cabled advice was received from the consulting engineer late on the evening of the 21st inst., to the effect that certain proposed trial crushings of ore for the purpose of determining the value of the parallel reef on the 9th and 10th levels have been delayed until 22nd inst., owing to continued caving-in of ground, which has made it difficult to maintain the average output. Until these trial crushings are completed it is not possible to formulate any definite policy, but Mr. Piper advises that probably it may be necessary after June 30th to effect some reduction in the milling grade at all events for six months. This reduction, if found necessary, would probably reduce the profit per month, during the period named, to £4,000, but the carrying out of this policy must depend upon future developments and the result of the trial crushings. With reference to the caving in of ground, the board believe this refers to certain stopes on the 5th and 6th levels, but in order to ascertain the exact position they have cabled to Bulawayo, and will publish the information when received. The undistributed profit, including gold reserve, amounted on March 31st, 1913, to £75,000.

* * * *

At the Kimberley Reefs property of the Mashonaland Agency, crushing commenced on the 7th of this month, and the return is being anxiously awaited. According to all accounts the mill is running smoothly, and a substantial output is expected. In this district, too, there has been much activity of late, and a good deal of quiet prospecting has been going on between Kimberley Reefs and the Shamva.

* * * *

The following is a cabled summary of the consulting engineer's report of the Lonely Reef for the quarter ended March 31:—Development work, 920 ft.; mill ran 73 days; crushed 11,536 tons, yielding 10,856 ozs. Ore reserves, 174,667 tons; average value, 1 oz. 1 dwt. No. 8 level south drive advanced from 454 ft. to 619 ft.; average width of reef is 27 in., assaying 9 dwts.; last 30 ft. give 1 oz. 4 dwts. 14 grains over 31 ins. No. 9 level south drive advanced from 246 ft. to 532 ft.; average width of reef is 41 ins., assaying 1 oz. 1 dwt.

* * * *

A recent cable from Matabele Queens says:—No. 5 level east drive: Average width of reef over length of last 150 ft. driven is 50 ins., average assay value 55s. 3d. and in face £10 12s. 6d. over 60 ins. Pay shute recently reached at No. 6 level; last 25 ft. driven average value £5 2s. over 28 ins. Reef has been struck at No. 7 level 120 ft. below No. 6 level assaying at this point £3 10s. over 12 ins. The above information is important and the high values so far exposed very satisfactory. The drives at the 5th, 6th, and 7th levels being now in the pay shute, a large increase of ore reserves may be expected, and the erection of a new reduction plant of a greater capacity than the old one is now under consideration.

* * * *

The secretary of the Cam and Motor Gold Mining Company, Ltd., issued the following official circular to shareholders in mail week: "I am instructed by my Board to lay before you a summary of the work accomplished on the property up to the 31st December last, when, as you were informed at the annual meeting, development [illegible]. The engineers report that the tonnage blocked out ready for the mill amounts to 1,016,240 tons of a gross value of £2,202,1[illegible] equivalent to 5½ years supply for the plant. The ore reserves being in such a satisfactory position, work is now concentrated, in addition to preparing the mine for stoping, on the erection of the plant. The following schedule shows in a concise form the footage on the Motor Mine, where the whole of the development work since the incorporation of the company has been carried out:—

	Feet.
Main Shaft Sinking	665
Main Cross-cutting	593
Driving	6,611
Cross-cutting	3,894
Winzing and Rising	3,883
Grand total	15,646

A considerable amount of the plant has already arrived at the mine and is now in course of erection. The workshops, foundry buildings and boiler house are finished, and in addition all the machine tools are in position. Most of the foundation work for the rest of the plant is completed, and satisfactory progress generally is being made. As stated in the annual report, the spur-line from the main Bulawayo-Salisbury line to the company's property has been constructed, and in addition a siding right up to the plant site has now been completed, so that all goods can be delivered from Beira, the port of transhipment, direct to the mine. A contract has now been signed for the supply of fuel for the roasters on satisfactory terms to the company, and deliveries are now taking place and being stacked ready for use. The directors have recently appointed as manager to the company Mr. J. McDermott, who has had many years' experience of properties containing ore of a similar nature to the Cam and Motor.

* * * *

The report of the general manager of the Globe and Phoenix G.M. Co. (Mr. Theo. Haddon) on operations at the company's property to the 31st December last, is dated Que Que, the 7th February. *Inter alia*, it is stated:—In consequence of the water famine, due to the severe drought, the period under review has been an anxious one, and caused me grave concern as to keeping your plant running and holding the organisation together. Scarcity of labour during the first five months further greatly embarrassed me. Happily these troubles were overcome, and the year closed with more satisfactory prospects. The troubles reported above have caused considerable extra expense, and delayed progress, but the final accounts show a very satisfactory mine profit, the actual production exceeding that of the previous year. The results are far better than at one time appeared possible. In comparing 1912 with 1911 consideration must be given to the creation of the gold reserve—reported below:—

	1912.	1911.
Tons milled	72,923	71,802
Fine Gold declared, all sources (ozs.) ...	113,083·6	114,576·5
Income per ton	£6 12 0·68	£6 15 10·5
Gross Cost, all South African charges ...	£129,863 6 5	£120,418 5 0
Cost per ton	£1 15 7·4	£1 13 6·49
Gross Mine Profit ...	£351,634 8 0	£367,411 10 5
Mine Profit per ton milled	£4 16 5·28	£5 2 4

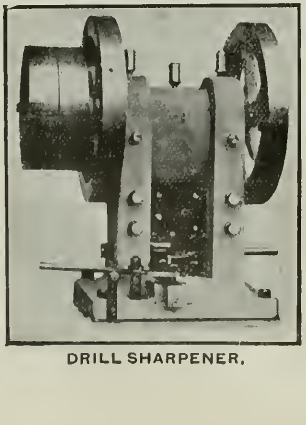
In addition to the above we produced during the year 4,223·226 ozs., valued at £17,737 11s. 11d., which stood to the credit of reserve account at 31st December, 1912. The new sands plant was not started until the end of December, due to scarcity of water; but during the preliminary run to the end of January has given satisfactory results. On a feed value of 5·5 dwts. a residue of ·7 dwt. being obtained, equivalent to an extraction of 87 per cent. It is estimated working costs will be in the neighbourhood of 8s. per ton when the plant is in full commission, on completion of a few adjustments. A new vertical shaft was started in June, and at 31st December had reached a depth of 477 feet. Progress since December has been delayed through inability of manufacturers to deliver the necessary steel sets, shipments due in Rhodesia in December not having left the rolling mills in England at the end of January. Fortunately, we have secured a temporary supply from Natal, and can shortly resume sinking operations. No orders have been placed for the permanent equipment of this shaft, the machinery now in use being the "Globe" disused plant, and a temporary headgear. Details of Phoenix mine development are dealt with by your consulting engineers. The ore reserves were determined as at:—December, 1912: 170,945 tons at 33·8 dwts.; contents, 288,897 ozs., value £1,213,367. Previous figures were:—December, 1911: 173,613 tons at 37·0 dwts.; value, £1,348,973. December, 1910; 178,221 tons at 33·9 dwts.; value, £1,268,950. Accumulated tailings, slimes, and residues are estimated to produce £133,000 profit. Heavy capital expenditure has been incurred over new plant and the new shaft. Details of the expenditure of £52,003 1s. were given in my interim report. Since July the additional expenditure has occurred, amounting to £30,954, which is redeemed monthly by allocation. The above expenditure practically completes the plants referred to, with the exception of vertical shaft sinking and equipment, which is proceeding. The new sands plant is completed, and is showing very satisfactory extraction, but it is bigger and cost more than originally contemplated. This is largely due to the important modifications introduced. Preliminary estimates were framed on the assumption that a filter press plant was the most satisfactory, and that wood fuel was to be used, but our subsequent investigations disclosed a more promising system for dealing with both slimes and fine ground sand. Our plans were modified and the filter press proposal was abandoned in favour of Dorr thickeners, and we are fully satisfied with the result. Further, the tank capacity of the plant was increased by 25 per cent. The storage and handling of the large quantity of wood fuel required monthly (1,000 cords) involving the employment of an excessive number of natives, construction of railway sidings, and also the advancing distance and cost of wood, decided us to use coal for roasting. This necessitated altering the design of the furnaces, increasing the height of the smoke stack 40 per cent. (consequent heavier construction) and addition of system of fan and piping for forced draught, and increased the cost of the fire boxes. Further, it was deemed advisable to erect steel buildings in place of wood, and to increase the size of bin storage. The unfortunate rise in prices of all imports and delays in delivery from Europe have added considerably to the expense, plus local troubles and delays due to shortage of labour, and its higher cost all round. Mechanically the plant is a good one. Its capacity was estimated at 8,000 to 9,000 tons per month, and we expect in the course of a month or two, after the present heavy rains, to bring it up to that tonnage, but to do so a few slight alterations will be needed to ensure a sweet and satisfactory roast. It is to be expected that the tonnage treated during the short rainy season will be less than the remainder of the year, as all the material has to be drawn from the dumps and wet material cannot be as satisfactorily handled as dry. All plant has been thoroughly maintained and is in good working order.

* * * *

The Rhodesian gold output for April was declared at 57,295 ounces, value £241,098, a decrease on the preceding month—which was a record—of 3,979 ounces, value £16,699.

Persistence of Ore in Depth.

"In a recent issue of the *Mining and Scientific Press*, Mr. Malcolm MacLaren criticises some generalisations on this subject that he attributes to Mr. T. A. Rickard, who, he states, concludes that after the oxidised zone and the zone of secondary sulphide enrichment are passed, ore deposits must be expected to become leaner with increasing depth. This he considers to be pernicious doctrine if universally applied; 'the more so that for most ore bodies it contains a kernel of truth.' Thus it is entirely true when its application is limited to a certain group of ore-bodies, namely, to those formed near the existing surface, including not only deposits formed in recent geological times, but also some of Paleozoic and pre-Cambrian age. In the latter case subsidence and burial beneath later deposits have protected the upper portions of these ore channels against the effect of erosion; and the auriferous conglomerate of the Witwatersrand is quoted as an example. Mr. MacLaren remarks that all deposits of this group originated from the cooling of rising solutions on approach to the earth's surface; but, he states, many deposits, occurring chiefly in Archean and Paleozoic rocks, and occasionally in Mesozoic strata, cannot be ascribed to simple cooling. Lode fissures in these rocks are normally very steep, while the strata are usually much disturbed. It is a fundamental axiom that in these later deposits the nature of the lode-wall exercises a vital influence on the richness and sometimes on the mineral character of the ore-body. Hence it rarely happens that a great depth is reached before the lode, worked from the outcrop downward, has passed out of the favourable rock. 'Herein lies the kernel of truth in Mr. Rickard's generalisation, but surely the fact should be stated in terms of geologic structure and not of depth.' Future industry, Mr. MacLaren considers, must more and more concern itself with concealed ore bodies, and it is here that a universal acceptance of Mr. Rickard's proposition would prove harmful both in the engineering profession and to mining capital."—*Canadian Mining Journal* (criticism by Malcolm MacLaren on paper by T. A. Rickard), Dec. 1, 1912, p. 805.



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RHODESIA'S MINERAL OUTPUT FOR APRIL.

Total Return, £271,913—A Decrease in Production.

The output of gold from Southern Rhodesia for the month of April has been declared at 57,295·38 ozs. fine gold, valued at £241,098, being a decrease of 3,978·98 ozs. in weight and £16,699 in value, as compared with the month of March. The March output, however, included 4,761·04 ozs. reserve gold declared, which was valued at £20,009. The following amounts and values of other metal and mineral products were also declared:—Silver, 11,559·39 ozs., valued at £1,246; lead, 31·01 tons, valued at £483; chrome iron, 5,152 tons, valued at £11,500; coal, 19,041 tons, sales £6,017; diamonds, 24·25 carats, valued at £109. The total value of the gold and mineral production was thus £260,153, as compared with £271,913 in the month of March. Appended is our usual monthly analysis of output:—

GOLD.

Note—All the declarations are in fine gold.

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
BULAWAYO DISTRICT.—				
Agincourt (H. L. Maidwell)	5	437	292.79	1230
Alice and Atlas (Est. R. Barkley, deceased)	10	471	102.36	430
Do. (tailings)	—	900	101.09	425
Anchor (M. Morrison)	5	120	50.28	211
Anterior (W. J. Lane)	2	126	43.73	184
Do. (tailings)	—	155	23.37	98
Bangali (Hicks and Arbery)	5	105	28.93	122
Big Ben (W. E. Hunt)	4	372	175.00	1155
Do. (tailings)	—	176	117.99	496
Bilhah (V. Friberg)	2	65	31.66	133
Blanket (Forbes Rhod. Synd., Ltd.)..	15	897	172.41	724
Blue Reef (J. Eisenhammer)	2	312	106.39	447
Bobs (Bobs Reef Synd.)	5	220	46.08	194
Bushtick Mines, Ltd.	26 3T	6036	252.68	1061
Do. (tailings)	—	3372	581.74	2443
Do. (slimes)	—	2818	263.50	1107
"C" (D. and C. Synd.)	10 1C	2039	111.90	470
Do. (tailings)	—	1736	160.93	676
Do. (slimes)	—	303	65.89	277
Cambrian (J. Fritz)	1 D	—	2.00	8
Champion (R. Aserman)	5	551	137.85	579
Do. (tailings)	—	272	33.04	139
Chokeford (C. & G.E. & F. Co., Ltd.)	(15 4P)	363	134.50	565
Do. (tailings)	—	180	19.75	83
Claremont Mines (Rhod.) Ltd.	20	2427	271.63	1141
Clean up (New Belingwe G.M. Syn.).	5	378	125.44	527
Cross (T. W. Angus)	2	130	32.43	136
Dam (W. H. Robinson)	2	110	23.61	99
Eagle A (Macdonald & Co.)	5	636	230.35	967
Do. (tailings)	—	252	34.28	144
Farvic (H. S. Henderson)	5	283	158.95	668
Do. (tailings)	—	300	39.53	166
Fred (Trans. & Rhod. Est. Ltd.) ...	5	701	551.41	2316
Imani (E. Rochfort)	2	189	49.73	209
Imbusine (Cummings & Berry) (tailings)	—	305	68.06	286
IXL (Forbes Rhod. Synd. (tailings) ...	—	598	33.79	142
Jumpers (Newton, McCoy and Early)	5	468	107.72	452
Kameel (New Rhod. M., Ltd.)	5	586	293.14	1231
Koba (Koba Syndicate)	5	175	37.36	157
Li Hang Chang (G. Leach)	3	269	50.05	210
Lone Hand (Armstrong, Furber & Alexander)	5	478	160.12	672
Lonely Reef G.M. Co., Ltd.	15 3T	4550	1085.74	4560
Do. (slimes)	—	4550	3224.45	13543
Mamba (J. M. Stone)	5	67	74.54	313
Do. (tailings)	—	160	50.24	211
Matabele 3 (R. M. Nairn)	10	1284	411.34	1728
Do. (tailings)	—	810	73.07	307
Matabele Queens' Co., Ltd.	10	1520	385.74	1620
Do. (tailings)	—	1520	496.34	2085
Do. (slimes)	—	860	88.15	370
Minnie's Luck A (Mrs. C. M. Reid).	5	350	62.75	263
Mulloch (C. & R. Synd.)	(5)	12	20.44	86
Nelly (F. D. Roscoe)	2H	705	339.78	1427
Do. (tailings)	—	300	36.19	152
New Eclipse & 18 (J. R. Stewart) ...	5	750	165.58	695
Do. (tailings)	—	240	20.25	85
Nita (J. Gardner)	5	650	57.73	242
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 1 P	1751	506.76	2128
Do. (tailings)	—	979	196.15	824
Orphan (J. H. Hoare)	1 D	1	10.74	45
Pannings (E. O. Davies)		—	[illegible]	13
Penzance (R. Urquhart) ...	2	60	8.65	36
Do. (tailings)	—	70	18.12	76
Poort (R. McConville)	2	160	53.25	224
Premier (McKenzie & Butement) . .	2	200	27.90	117
Princess (C. A. Abbott)	2	211	43.32	182
Rainbow D.B.S. (P. Allport) ...	5	610	108.85	457
Red Rose (C. G. Bancroft)	3	144	32.67	137
Riversdale (Bruhns & Schwarz) ...	5	456	122.23	513
Do. (tailings)	—	320	16.04	67
Riversdale 2W (A. Fraser)	3	105	31.17	131
Riverside (R. Martindale)	2	100	41.10	173
Susanna Mines, Ltd.	8	1012	429.29	1803
Do. (tailings)	—	565	88.50	372
Teutonic (Hanover G.M. Synd., Ltd.)	5	730	238.85	1003
Tuff Nut (King's Synd.)	5	600	260.19	1093
Do. (tailings)	—	380	68.38	287
Umvoti (Henderson & Toshack)	2	200	48.33	203
Up-to-Date (Cumings & Berry)	3	375	100.58	422
Worthless 1 N. E. (Forward R) G.M. Co., Ltd.)	5	130	11.99	50
Bulawayo District Total			14,451.96	60,823
GWELO DISTRICT—				
Ardpatrick (C. Maleham)	3	348	126.74	532
Beacon Hill 1 (R. Aserman)	2	145	336.39	1413
Broad Arrow (F. Ewing)	10	416	67.79	285
Do. (tailings)	—	200	6.40	27
Cinderella (P. Burt)	1E	535	42.02	176
Csardas (Wolfshall Syndicate)...	10	458	465.34	1955
Do. (tailings)	—	330	71.54	300
Do. (slimes)	—	128	21.75	91
Delegates (O. Hardy)	2	20	6.20	26
Gaika G.M. Co., Ltd.	5 1C	2720	994.54	3967
Do. (tailings)	—	1510	70.98	298
Do. (slimes)	—	1640	131.67	553
Gartley (A. J. Grant)	2	67	51.39	216
Glen Rosa No. 1 (H. G. MacKintosh)	2	122	25.98	109
Do. (tailings)	—	93	8.00	34
Globe and Phoenix G.M. Co., Ltd.	40 10 P	6550	8455.67	35514
Do. (concentrates)	—	218	695.19	2920
Do. (tailings)	—	4010	608.68	2556
Do. (slimes)	—	2155	556.71	2338
Gretna Green (M. L. Price)	5	65	48.21	202
Invulnerable (A. E. West)	5	160	37.02	155
Moss (James & Morrisby)	2	231	516.71	2170
New Dunraven G.M. Ltd.	5	900	181.91	764
Do. (tailings)...	—	600	36.16	152
New Trial (W. Cock)	1H	50	7.35	31
N'Kanya (Tranmer Gold Synd.)	—	—	1.16	5
North Bonsor (Cornish Syndicate) ...	15	2027	540.32	2269
Do. (tailings)	—	1260	138.90	584
Pannings (J. W. Barry)	—	—	0.60	3
Pompei (Pharos Synd.)	2	132	35.67	150
Pretty Polly (New Rhod. R. Co., Ltd.) (tailings)	—	385	24.92	105
Red Hill Dev. Syn., Ltd.	1C	2090	68.72	289
Do. (tailings)	—	1232	111.84	470
Rooster 3 (G. B. Havnar)	2	286	86.25	362
Sceptre (R. & W. Syndicate)	1C	364	99.65	419
Do. (tailings)	—	245	23.90	100
Selukwe Columbia G.M., Ltd. ...	1C 3P	3100	1056.82	4439
Do. (concentrates)	—	130	106.19	447
Do. (tailings)	—	2065	336.55	1416
Do. (slimes)	—	928	110.78	466
South Bonsor (Ideal Synd.)	10	788	69.35	291
Tebekwe (A. N. Tyrrell)	15	1487	168.85	709
Veracity (J. Fischer) (slimes)	—	410	35.07	147
Wanderer (Selukwe) G.M., Ltd. ...	1 GR	18525	1707.65	7172
Willow (W. C. Spargo) (tailings) ...	—	300	2.03	9
Winston (J. Jones)	6	95	99.35	417
Gwelo District Total			18,344.91	77,053

MATABELELAND TOTAL	32,826.87 ozs.
VALUE	£137,876

MASHONALAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
HARTLEY DISTRICT—				
Acorn Gold Mines, Ltd.	5	529	118.72	499
Do. (tailings)	—	360	53.17	223
Agnes (P. S. Triggs)	5	514	130.59	548
Battlefields (Minaar & McArthur) ...	2C	1290	267.83	1125
Do. (tailings)	—	1034	106.36	447
Do. (slimes)	—	256		

	No of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Blue Rock (Blue Rock Synd.	2	280	101.76	427
Do. (tailings)..	—	180	45.81	192
Brilliant (Mabel's Luck Synd.)	7	700	508.03	2134
Do. (tailings)	—	304	144.87	608
Butterfly (F. W. G. Richards) (tailings)	—	1000	10.50	44
Cheshire Cat (Tavener & Duncan)	5 1P	402	238.05	1000
Do. (tailings)	—	253	76.79	322
Do. (slimes)	—	149		
Concession & W. Extension (C. E. Simpson)	5 1C 2P	2056	478.35	2047
Do. (tailings)	—	1730	121.82	512
Corsilla D. (Yellow Jack Synd.)	2	100	8.06	34
Do. (tailings)	—	70	33.81	142
Crown No. 2 (Crown Synd.)	2	120	17.81	75
Do. (tailings)	—	100	20.41	86
Dalny (Philip Wiggins, Ltd.) (tailings)	—	300	23.25	98
Dalny 1W. (Shagari Mines, Ltd.) ...	5	300	48.73	205
Do. (tailings)	—	300	51.02	214
Dalny 1N.E. (Philip Wiggins, Ltd. (tailings)	—	85	18.25	77
Dowry (P. A. Enke)	1 PN	325	47.35	199
Dreadnought (W. E. Masters)	1 C	334	45.99	193
Duke No. 1 (Jose & Munro)	5	100	21.08	89
Duke No. 2 (Jose & Munro)	(5)	50	10.00	42
Eiffel Blue & E. Ext. (Willoughbys) ..	10	1437	607.11	2550
Do. (tailings)	—	870	63.25	265
First Venture A. (J. P. Carroll)... ...	2	170	50.74	213
Giant Mines of Rhodesia, Ltd. ...	30 2T	11580	3279.49	13910
Glasgow Mines, Ltd.	5	586	243.17	1021
Do. (tailings)	—	300	63.71	268
Glencairn No. 3 (Glenrosa Synd.). ...	4	416	282.61	1187
Do. (tailings)	—	253	14.89	63
Golden Valley (J. Mack)	10	1006	149.65	629
Do. (tailings)	—	490	58.64	246
Iberia 1 (Hartley Pioneer Synd.)... ...	1H	448	88.69	372
Juno (H. R. Nicholl)	5	255	137.23	576
Kanyemba (Kanyemba Synd.)	5	470	472.26	1983
Do. (tailings)	—	236	94.84	398
Lily 1 (J. Erickson) (pannings)	—	—	0.61	3
Luke (Luke Synd.)	3	120	28.73	121
Do. (tailings)	—	80	19.18	81
Nada (G. H. Fison)	1PN	45	26.84	113
New Milky Way No. 3 (J. Mack).. ...	5	350	48.25	203
Oleander G.M. Co., Ltd.	3	315	60.22	253
Do. (tailings)	—	129	69.80	293
Do. (slimes)	—	186		
Owl (A. Rolfe)	10	1360	489.82	2057
Do. (tailings)	—	985	140.38	590
Pickstone Gold Mines, Ltd.	10	1320	400.90	1684
Do. (tailings)	—	660	256.11	1075
Pomposo (J. Knott)	5	129	60.70	255
Rosherville (J. Tilbury)	1 H	56	33.25	140
Rover (S. H. Coker)	2	100	54.88	230
Seigneury (Cen. Min. & In. Cor. Ltd.)	5	390	90.05	378
Do. (tailings)	—	390	26.13	110
Shepherds (Phoenician (Rhod.) Co., Ltd.)	5	549	120.63	507
Do. (tailings)	—	352	169.08	710
Sid (Sebakwe & Dist. Mines, Ltd.) ...	5	654	220.12	925
Do. (tailings)	—	985	113.37	476
St. Oliven No. 4 (Yellow Jack Synd.).	2	320	79.91	336
Tea (Cent. Min. & Invest. Corp., Ltd.)	5	842	215.28	904
Do. (tailings)	—	385	39.81	167
Thistle-Etna G.M., Ltd.	1C	3545	927.37	3895
Do. (tailings)	—	2712	107.13	450
Do. (slimes)	—	676	44.21	185
Three Cheers (F. J. Nalty) (tailings)...	—	240	10.74	45
Trinidad 1 (Crozleigh Synd.)	(5)	35	18.55	78
Try Me 2 (R. R. Aitkin)	5	300	196.02	823
Warthog (C. Davidson)	5	17	6.66	28
Washington (I. J. Minaar)	5	400	268.36	1127
Do. (tailings)	—	350	41.99	176
Do. (slimes)		600	31.52	132
What Cheer D.B. 1 N.E. (H. Moser)	5 1H	780	85.72	260
White Rose (J. Mack)	5	353	76.42	321
Do. (tailings)	—	224	12.50	52
Hartley District Total			12,954.93	54,546
Lomagundi District—				
Alluvial (R. G. Harding)	—	—	19.00	206
Eldorado Banket G.M. Co., Ltd.	20 2C 8P	7200	3345.81	14189
Do. (tailings)		7144	928.75	3939
Lannett (A. L. R. Morkel)	2	714	126.71	532
Lone Hill (Moll & Platt)	2	245	85.80	360
Mint (J. A. Morris) Pannings	—	—	18.18	77
Rowdy Boys No. 2 (Sceptre Synd.) .	1Pn	735	31.89	134
Ventura (Stone & Standen)	2	305	128.42	539
Lomagundi Total			4,714.56	19,976

	No. of Stamps.	Tons Treated	Yield. ozs.	Value. £
Mazoe District—				
Authentic (Mrs. Adamson) (tailings).	—	400	15.85	67
Commonwealth G.M. Co., Ltd.	(30)	250	25.60	109
Do. (tailings)	—	150	18.20	78
Do. (slimes)	—	100	6.20	26
Gadteara & P.R. 1 (P.R. Synd.)... ...	1D	52	4.13	17
Goth (Goth Syndicate)	3	136	100.33	421
Honest (G. Brown)	3	115	37.87	159
Jumbo G.M. Co., Ltd.	30	2850	538.34	2288
Do. (tailings)	—	1700	383.34	1629
Do. (slimes)	—	1150	130.94	557
Mitre 8 (Bishop's Synd.)	1D	12	17.53	74
New Found (D. H. Curry)	5	310	192.91	810
Pompei A (R. Ricardo)	5	251	105.25	442
Prodigal (A. O. P. Reynolds) (Pannings)	—	—	2.25	9
Puff Adder (Puff Adder Synd.)	2	196	76.55	321
Thornhill (Oceola G.M. Co., Ltd.) ...	5	706	102.25	429
Tom Cat (Monarch (Tati) G.M. Snyd.)	1 Pn	332	139.92	588
Umkulu DB 1W (Llahsram Synd.) ...	2	207	45.89	193
Mazoe Total			1,943.35	8,217
Salisbury District—				
Abercorn (J. Seton Rogers) (tailings)..	—	320	19.66	83
Elsinore (J. P. Reynolds)	1D	1	2.25	9
Hopefield (Hopefield Syndicate)	2	250	142.27	598
Do. (tailings)	—	250	37.65	158
Inyague 3 (P. L. Peters)	2	108	44.57	187
Louise Grand (H. S. Plant)	2	703	82.50	347
Do. (tailings)	—	703	91.23	383
Mashona (B. G. Byerley)	2	55	29.53	124
Do. (tailings)	—	204	11.25	47
Mont d'Or (Claxton & Russell)	2	104	122.96	516
New Full Back (New Full Back G.M. Synd.)	2	95	22.44	94
Special (C. Egert)	(2)	13	1.27	5
Salisbury Total			607.58	2,551
Umtali District—				
Cairndhu 2 W (E. K. Evans) (tailings).	—	40	14.06	59
Do. (slimes)	—	110		
Elgin (Umtali Waterfall Synd.)	(10)	368	165.98	697
Do. (tailings)	—	155	42.70	179
Do. (slimes)	—	109		
Kent (E. Evans)	5	400	124.36	522
Do. (tailings)	—	300	39.06	164
King's Daughter D.B. (Umtali Waterfall Synd.)	(10)	464	75.18	316
Do. (tailings)	—	217	21.27	89
Do. (slimes)	—	1257	61.58	259
Mamine (J. Cunningham)	5	62	24.78	104
Mecca (Umtali Waterfall Synd.)	10	256	61.70	259
Pilgrim 2 E (J. Meikle)	5	580	319.80	1343
Quagga (Quagga Synd.)	5	900	221.23	929
Rezende Mines, Ltd.	85	9600	1461.94	6203
Do. (Concentrates)	—	140	502.17	2101
Do. (tailings)	—	2931	310.30	1316
Rezende D B 2 (Imbeza Synd. No. 2).	10	3275	463.24	1966
Do. (concentrates)	—	6	116.18	491
Umtali Total			4,025.53	16,997
Victoria District.—				
Texas (G. Scott)	5	770	215.31	904
Vulcan (L. K. Robinson) Pannings ...	—	—	7.25	31
Victoria District Total			222.56	935

MASHONALAND TOTAL ... ... 24,468.51 ozs.
VALUE ... ... £103,222.
GRAND TOTAL ... ... 57,295.38 ozs.
VALUE ... ... £241,089.

C : Chilian Mill; T : Tube Mill; G.R. : Gates Roll; H : Huntington Mill; P : Grinding Pan; Pn. : Pneumatic Mill; D : Dolly.

SUMMARY.

Gold	57,295.38 oz.	£241,089
Silver	11,559.39 ozs.	1,216
Lead	31.01 tons	483
Chrome Iron	5,152 tons	11,500
Coal	19,011 tons	6,017
Diamonds	24.25 carats	109

GRAND TOTAL VALUE MINERAL OUTPUT ... £260,453

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Red Cross Society.

To the Editor, *South African Mining Journal.*

Sir,—On behalf of the promoters of the Red Cross Society, I wish to reply to the letter by "Onlooker" in your issue of [illegible]. I regret that the reasons made clear to him for the formation of a Red Cross Society were of a disappointing nature; the promoters therefore regret that it is not possible, after a long and intimate knowledge of First Aid and Ambulance Work—to continue to support the other institution, which has not made any attempt to adapt itself or its rules and regulations to South African conditions nor to adapt its text book to mining work. The Government Mining Engineer publicly referred to this latter some time ago. Mr. Alpheus Williams, the General Manager of De Beers, came expressly from Kimberley to make inquiries into the proposed working of the new Society, owing to dissatisfaction with the hide bound red tape regulations of the other institution. The statement by your correspondent that the meeting was called to "give certain disappointed ex-members of the St. John Ambulance Association's General Committee an opportunity to vent their personal spite against the Chairman of the Transvaal Branch of the Association," is a deliberate perversion of the truth, which is amply proved by the account of the meeting given by the *Rand Daily Mail* reporter (who certainly cannot be accused of bias), in which it is stated that "The Chairman at the outset evinced a desire to keep this disagreement in the background, and to advocate the formation of a new Society on the grounds of the necessity for a new order which should specialise in the ambulance work peculiar to the practice of mining."

Your correspondent, with an equal disregard for the truth, states that the meeting was called in order to "circumvent the strictness of the Mining Regulations by introducing a cheap class of Ambulance Certificates on the mines, to take the place of the present St. John Ambulance Association Certificate which sets a fairly high standard of knowledge." According to the Mining Regulations (Chap. xxiv. Sec. 277, Clause 3), it is necessary for certain mining officials to be in possession of a "certificate of an Ambulance Association recognised by the Minister." It is not possible that the Minister of Mines will recognise the certificate of any new society which is likely to grant a "cheap class of ambulance certificate." Prominent mining officials and Medical men having expert knowledge of the matter, have stated specifically that the text book issued by the St. John Association is not adaptable to or specialised for mining work, and this was practically admitted by Mr. V. E. Davis, who stated at the meeting that he was instructed by the Railway Department to oppose the formation of the new Society, a position characterised by representatives of other Government Departments as somewhat extraordinary. Mr. Davis was understood to say that the authorities at St. John's Gate, London, might possibly attempt to meet local ambulance requirements in so far as mines were concerned, but I venture to think that the members of the medical profession on the Reef have at least an equal knowledge of the subject as the authorities at St. John's Gate. In any case, the medical men on the Committee of the Red Cross Society will see to it that any certificate granted by the Red Cross Society will rank as high, if not higher, than any certificate issued by the St. John Ambulance Association.

As to the "personal quarrel between a handful of local Johannesburg gentlemen" (who, by the way, happen to be mainly leading medical men on the Rand) "and the Chairman of the local Association," I can well leave that to them, but it would seem reasonable to anyone that there must be some good reasons for the resignation from the Committee of the Association of a number of medical men who have done acknowledged excellent work for a number of years. I must remark, however, that if the Association is "still doing an enormous amount of good and is rapidly extending its operations in every direction," it is doing it very stealthily, for one rarely hears of it now-a-days. For instance, can "Onlooker," who sees so much of the game, inform the public—which, after all, provides the funds for the Association's work—when the last annual meeting of the Association was held, and the statement of accounts submitted for approval and adoption? Will "Onlooker" admit that the resignations of the medical men and other members of the local general committee, have not been submitted yet to the remaining members of the committee? Is it not a fact that the local general committee *has not met once since last October* to do the work for which its members were elected or appointed? (excepting on the 14th and 16th inst., when the committee was called together to consider "special general" business connected with the visit of two delegates from Capetown). Does "Onlooker" or even the members of the local general committee know that the "Executive" Committee of the Association consists, according to the Chairman, of the Association's Vice-Presidents (eight very busy gentlemen in official capacities, two at least of whom are resident in Pretoria), together with the Chairman and Secretary, and that that "Executive" has been called together only three times since December or even October. Will "Onlooker" controvert the statement that [illegible] and the [illegible] Secretary. Will [illegible] tion in hand, can be [illegible] than it [illegible] a trouble, [illegible].

It will, no doubt, be news to [illegible] along the reef that Mr. E. F. [illegible], [illegible] to [illegible] the [illegible] of the Association [illegible] presented to the [illegible] general committee, [illegible] competition [illegible] engaged in mining work. I [illegible] the [illegible] and the remaining members of the [illegible], to [illegible] from the Chairman the reasons why such a valuable [illegible] trophy is kept hidden away, and has never been offered [illegible] to the men on the mines for competition for the last six years. I can only state here that I know that Mr. R[illegible] has expressed his personal disappointment at this fact, that he has informed the Association that he considers it has forfeited its right to hold the shield, and that he has asked the Association to hand the shield to another Society. That Society wrote to the Association on the [illegible] January last, asking when it would be convenient to hand over the shield, which letter was acknowledged by the Secretary on the 17th January, stating that the matter would be laid before the Committee *in due course*. Evidently the committee, four months afterwards, has not met yet, for no further reply has been received.

"Onlooker" again departs from the truth in implying that [illegible] much practice is required on the part of operating units (of the St. John Ambulance Brigade), was one of the main reasons for the formation of the Red Cross Society. It will be evident, again, to any unbiassed person that constant practice is absolutely essential to first aid men, and it will be the endeavour of the Red Cross Society to foster this in every possible manner. The only person who complained that the rules and regulations of the St. John Ambulance Brigade were not sufficiently elastic was Mr. A. F. Williams, the General Manager of De Beers, who confessed to having [illegible] years experience of first aid work. (The employees at De Beers [illegible] particularly well catered for in regard to first aid and ambulance work, and every inducement and encouragement is given them by the Company to become efficient. The Rand mining companies can learn a great deal from Kimberley in this respect, and I would suggest that their example might well be copied. No one is better able to speak of the high efficiency of the De Beers men than Mr. Swinburne, the Acting Government Mining Engineer (who has had practical personal experience of their very excellent work.) To return to Mr. Williams: He stated, according to the *Rand Daily Mail*, "that owing to the manner in which progress was blocked by red tape and the difficulty that has been experienced in dealing with the local Cape organisation, it was necessary to consider the formation of a new and more elastic body." The draft rules of the Red Cross Society are ample evidence that this elasticity, which is required, is to be provided.

The promoters of the Red Cross Society do not consider that twelve practices and one re-examination per year are "irksome." The writer, after his experiences with the Ambulance Competitions organised by the Chemical, Metallurgical and Mining Society last December, in a personal report to the Minister of Mines on the subject, which was asked for, made representations that the mining regulations should provide for the re-examination of first aid men. The names of the members of the Provisional Executive Committee of the Red Cross Society are a sufficient guarantee that there will be no easy certificates to be obtained from the Red Cross Society. There is no desire whatever on the part of its promoters to work against the other organisation, but had the older Association only moved with the times, the Red Cross Society would not have been heard of.

The only desire of the Red Cross Society is to push on on a thoroughly public, democratic and practical manner every branch of first aid and ambulance work energetically, progressively and efficiently. To do this it appeals to the mining community and the public for their active support, assistance and sympathy.

I regret, extremely, that what appears to be a deliberate attempt on the part of your correspondent "Onlooker" to damn those who are endeavouring in a public manner to work for the good of their fellow men, necessitates this lengthy encroachment on your space to place before your readers the true facts of the case. I am, etc.,

FRED. ROWLAND.

Hon Secretary (*pro tem*) The S.A. Red Cross Society.
P.O. Box 1183, Johannesburg, 24th May, 1913.

A New German Paper.

To the list of newspapers published in South Africa will be added towards the end of next month a new weekly German journal, issued in Johannesburg, called "Sud-Afrika." It is founded and owned by "Sud-Afrika, Ltd.," a company registered in the Transvaal.

THE DIAMOND-CUTTING INDUSTRY.—II.

Findings of the Select Committee—Two Minority Reports— Majority Favour a South African Industry.

FIRST MINORITY REPORT.

The first Minority Report is signed by Senators Sir Meiring Beck and W. F. Lance. It reads as follows:—We agree generally with the conclusions arrived at in the foregoing report, and we concur in the suggestion in regard to rendering a certain quantity of rough diamonds available for cutters in this country. We think there is ample reason to believe that skilled workmen in sufficient numbers can be induced to come here at rates of wages which will make it possible to cut with success. The advisability of an export tax sufficiently high to bring the industry here has engaged our serious attention, and whilst realising that this might present a possible solution of the question, we cannot agree with the recommendations of the majority of the committee, nor can we make any other recommendation on the subject of such a tax. The financial and industrial considerations involved are most important, and we are strongly of opinion that it would be well for the Government before considering a policy in this direction to consider the advisability of supplementing the labours of this committee by a further and more special inquiry into the financial aspects of the case. The obvious importance of a cutting industry to this country should justify a closer investigation into the financial considerations involved than has been possible for this committee. It is evident that diamonds from German South-West Africa carry a very considerable tax, and it may be well not to dismiss the possibility of an ultimate solution in this direction without further inquiry. In the meantime we are of opinion that a start may be made in a small way which, whilst not jeopardising any existing interests, would, to a considerable extent, afford the means of testing many of the issues involved. To this end we suggest that the Government should take into consideration the desirability of creating a fund of, say, £200,000 per year for a fixed period of years, to be utilised in the payment of a direct bonus on diamonds cut in this country, and for other means of direct encouragement of the industry. The details of such a scheme would require to be very carefully considered with a view to securing the most judicious application of such assistance. The method of providing the suggested fund would similarly be matter for careful consideration and the allocation of a sufficient portion of revenue derived from the diamond industry naturally suggests itself. If for that purpose the augmentation of that revenue is considered necessary, the alternatives of an increase in the sum derived from profits tax or a small percentage tax on production or on export may be mentioned. There is evidence to show that a tax of 2 per cent. on value of production or upon export (which would produce about £200,000 per annum) would not seriously be felt or be likely to hamper the industry to any appreciable extent.

SECOND MINORITY REPORT.

The Second Minority Report, signed by Senator Marshall Campbell, reads as follows:—I am of opinion that the establishment of a diamond cutting industry within the Union of South Africa, either by the imposition of an export duty on rough diamonds or a system of bonuses, or both, upon the evidence and information which your committee has had placed before it, would be a most dangerous enterprise for the Union to embark upon, and, in forming such opinion, I am guided by the following facts revealed to me by the evidence and information which has been at the disposal of your committee: (1) That the profits derived from the diamond industry form one of the principal sources of revenue to the Union, having supplied to the Treasury of the Union during the last three financial years over two millions sterling. (2) That the imposition of an export tax, however small, on uncut diamonds, would greatly facilitate and financially benefit all our competitors both in German South-West Africa and elsewhere, to the detriment of the Union's diamonds on the world's market. (3) That a diamond cutting industry of great magnitude has grown up during centuries in Holland and Belgium, amongst financial, social, and economic surroundings, which have become interwoven with it in such a manner that, in spite of repeated attempts on the part of other and richer countries to draw it away, it still represents almost the entire diamond cutting industry of the world. (4) That the great world's market for rough diamonds is situated conveniently amidst one of the most thickly populated areas in Europe, and that the stones, although sorted at every diamond mine before being sent to London, are re-sorted there in what are known as "series," in such a manner as to be acceptable to the buyers—the master cutters—who each specialise in certain classes of stone. That a dislocation of such a convenient state of affairs would naturally meet with the most strenuous opposition on the part of all the buyers, who are, after all, always the parties to please in any commercial transaction. (5) That no evidence has been furnished your committee regarding the reasons why the diamond cutting industry of Holland and Belgium has not been transferred long ago to the United States of America, which "consumes" 75 per cent. of the world's annual output. (6) That the following facts should be borne in mind when considering the transfer to the Union of the diamond cutters of Holland and Belgium: (a) The great difference in the conditions of life; (b) the great difference in the cost of living in the Union, especially of articles of food and refreshment; and, even should the diamond cutters be paid 150 per cent. higher wages in the Union, it is not assured that they would remain satisfied with them, in view of the great excess of the ages of the diamond cutters in Holland and Belgium over other skilled wage-earners there; (c) The industry is completely controlled by one of the most powerful trades' unions in the world, which would quickly set its machinery in motion for the rectification of any supposed grievance; (d) The lack, in South Africa, of places of entertainment which they, the diamond cutters, are much accustomed to frequent in their leisure hours; (e) The strict observance of the South African Sabbath. (7) That it is very unlikely from the evidence offered that even 150 per cent. in excess of their wages in Holland or Belgium would place the diamond cutters in such a comfortable position in South Africa, even at the Cape, where living, it is asserted, is cheaper. (8) That it is improbable, even if a high export duty is imposed on uncut diamonds, that the master cutters, who are generally men of considerable wealth, or the smaller ones who are accustomed to be heavily financed by the banks practically on the security of their good name alone, would risk their capital in transferring their factories to the unknown in South Africa, when they already have a sound commercial proposition in Holland and Belgium. (9) That the effect of the imposition of a tax on all uncut stones exported from the Union—whether such tax, or a portion of it, is used for revenue, or in paying bonuses to those establishing diamond cutting factories in the Union, is of no matter—would be to raise the market value of diamonds in the world's market and decrease the profits on the Union's stones, the production of which will have to be reduced owing to the world's annual consumption being limited in value. (10) That in view of the increased cost of diamonds generally, in consequence of the imposition of a South African export duty, the number of "consumers" would be proportionately reduced, and, as a consequence, the dismissal of both white and coloured labour from the Union mines would follow, and that it is unlikely that the number of Europeans belonging to a diamond cutting industry in the Union would, for a good many years, counterbalance that number, or compensate for the increase in I.D.B. which would follow the establishment of a diamond cutting industry in South Africa. (11) That the share in profits derived from diamonds won from the Union mines has been fixed by law at 60 per cent. in the Transvaal Province, 40 per cent. in that of the Orange Free State, and 10 per cent. in that of the Cape, and that there are vested rights to be respected, and also the rights of the British and foreign investors, for without outside capital no new country can develop its resources. (12) That there has been a diamond cutting industry in the Union of an infinitesimal and unimportant nature, representatives of which have favoured your committee with much evidence, but it has not been found that any real craftsmen have been engaged, or that the two or three persons who have been employed therein have had any quantity of stones to cut, for the river diggings, even if the large mines would not entertain dealings on so small a scale, afforded them opportunities of obtaining good stones. (13) That it must be borne in mind that the upheaval created by an attempt to establish diamond cutting factories in South Africa which threatens to dislocate the diamond cutting industry in Europe, will have to face the combined forces of the many millions sterling of capital controlled by the banks, the buyers, and the diamond buying syndicate and invested in that industry. (14) That the diamond market is a delicate one, as will be seen on reference to the diamond crisis of 1908, its causes and grave financial loss to South Africa. From the foregoing facts, which can all be amply substantiated by the evidence, it will be seen that it is by no small change that the supporters of the Majority Report seek to stagger the financial and commercial conditions of the country; but by proposals which, if carried out, will cause such a dislocation and upheaval of the existing condition of things as to be of serious danger to the financial interests of the Union. No one in South Africa can be more anxious to see new industries established in the Union than I am, but for the people of South Africa to adopt such a proposal as the imposition of a tax upon all uncut diamonds exported from the Union at the instance of the agitators of this movement, would be nothing short of folly. In the diamond industry of the Union we have not only a successful and well-organised industry, firmly established, and contributing very largely to the annual public revenue of the Union, but also to the revenue of our State railways, to the farmers, to merchants, and to storekeepers, who supply it with merchandise, not to speak of a sum of almost three millions sterling which is annually paid out by such industry in wages circulated in the Union. The gross expenditure of the Union diamond mines, not including their revenue to Government, averages for the last three years over four and a half millions sterling. One may carry the arguments put forward by the supporters of the Majority Report even further, and extend their principle to the feather industry by imposing a duty on all undressed ostrich feathers exported from the Union. For these feathers are on all fours with the diamonds, and they leave the country in the rough, are sent to the market in London, and then on to Brussels to be dressed. To introduce the principle of export taxes into our fiscal system might have an extended application far beyond the intention of its advocates. As a means of effecting a revolution in the diamond-cutting industry, such a tax would have to be of such a magnitude that it might seriously interfere with one of the sources of revenue. It would not, in my opinion, be justified under existing circumstances, and, therefore, for the reasons given above, I feel compelled to record my dissent from the finding of the Majority Report.

THE YEAR WITH THE GINSBERG G.M. CO.

Satisfactory Developments in the Northern Section—Treatment of Accumulated Slimes.

Mr. John Munro, presiding at the annual meeting of this company, held on Wednesday last, having reviewed the annual report and accounts, said, *inter alia*:—

Active development has been carried on in the north section of the property, and it is now definitely ascertained that to the east of the north shaft we shall have two levels below the point at which at one time it was considered the reef came in contact with the East Rand dyke. The north shaft was sunk 292 feet, and since the close of the financial year a further 17 feet have been sunk. As the ninth drive east is extended a marked improvement takes place, and where fully exposed the values are very satisfactory. A considerable amount of exploratory work has also been carried out in the old workings, resulting in the opening up of blocks of good payable ore. Your directors have decided, on the recommendation of the consulting engineer, to instal a small plant to treat accumulated slimes. It is estimated that about 60,000 tons are available, and this plant now being erected is designed to treat about 750 tons per month. The profits since the end of the year have not been so high as the 1912 average, although there has been a further reduction in working costs. The lower profits are due to a drop in the grade, which, however, need only be regarded as of a temporary nature. Already there are indications of an improvement and it is anticipated that for the present month the result will be considerably better than that for April. It gives me pleasure to record that the position as regards native labour has been unusually good as compared with previous years.

APRIL YIELD, COSTS, AND PROFITS.

Chamber of Mines' Analysis.

The usual monthly analysis of the gold production for April issued by the Chamber of Mines is presented hereunder:—

The Witwatersrand.

	Total value recovered	Value recovered per ton milled.		Total working cost per ton milled		Total working costs	Working profit	Working profit per ton milled	
	£	a.	d.	a.	d.	£	£	a.	d.
1. Aurora West United ...	18,581	26	5	20	9	14,829	4,018	5	7
2. Bantjes Consolidated ...	33,302	23	8	23	5	32,804	264	0	2
3. Brakpan Mines	76,243	28	0	19	0	51,251	24,305	9	0
4. Cinderella Cons.	21,965	24	6	26	9	23,998	*1,820	*2	0
5. City Deep	85,180	37	11	24	8	54,538	28,389	12	10
6. City and Suburban ...	51,028	38	1	21	11	29,345	21,054	15	8
7. Cons. Langlaagte	63,334	27	9	18	3	41,265	22,070	9	9
8. Cons. Main Reef	34,564	29	6	20	0	23,363	10,768	9	3
9. Crown Mines	297,073	30	3	17	0	167,060	126,849	12	11
10. Durban Roodepoort ...	15,173	21	7	15	10	11,150	4,022	5	9
11. Durban Rood. Deep ...	39,190	30	2	24	4	31,665	7,065	5	5
12. East Rand Proprietary.	253,959	30	3	18	11	153,287	91,991	11	4
13. Ferreira Deep	120,249	43	5	20	5	56,246	62,012	22	6
14. Geduld Proprietary ...	18.286	26	6	23	5	16,177	2,067	3	0
15. Geldenhuis Deep	90,226	29	11	23	5	70,626	18.529	6	2
16. Ginsberg	20,007	26	8	19	8	14,768	5.239	7	0
17. Glencairn Main Reef ...	16,838	15	5	13	11	14,126	2,714	2	8
18. Jumpers-cum-Treasury .	11.380	33	11	39	9	11,326	1,003	3	6
19. Jupiter	43.616	20	3	18	5	39,632	4,529	2	1
20. Knight Central	28,719	22	2	19	10	25,181	3,189	2	6
21. Knights Deep	79,938	15	3	10	8	56,039	23,039	4	5
22. Langlaagte Estate ...	60,331	20	3	17	0	45,641	15,100	5	8
23. Luipaardsvlei Estate ...	18,694	22	1	19	1	16,169	2,304	2	9
24. Main Reef West ...	31,166	29	4	22	4	23,628	7,124	6	9
25. May Consolidated	14,922	19	6	14	2	10,863	4,027	5	3
26. Meyer and Charlton ...	32,820	46	9	17	11	12,947	20,756	28	8
27. Modderfontein B. ...	61,227	36	0	16	3	27,692	32,900	19	4
28. New Goch	27,908	20	1	16	4	22,759	5,137	3	8
29. New Heriot	21,884	34	3	20	11	13,077	8,597	13	9
30. New Kleinfontein	77,313	29	10	17	11	46,488	29,944	11	6
31. New Modderfontein ...	100,879	38	8	19	3	50,254	49,554	19	0
32. New Primrose	36,233	28	7	13	10	17,485	18,749	14	10
33. New Rietfontein ..	18,652	23	3	20	1	16,122	2,530	3	2
34. New Unified	16,651	26	8	18	10	11,572	5,080	8	3
35. Nourse Mines	82,542	31	5	22	8	58,942	22.683	8	9
36. Princess Estate	27,857	25	8	23	9	25,788	2,002	1	10
37. Randfontein Central	275,843	23	9	16	10	194,348	80,121	6	11
38. Robinson	103,186	34	6	13	10	41,027	60,599	20	4
39. Robinson Deep	81.981	27	8	16	3	47,424	32,502	11	2
40. Roodepoort United ...	25.240	18	9	17	9	23,915	1,389	1	0
41. Rose Deep	99,949	28	6	16	6	56,710	41,600	12	1
42. Simmer and Jack ...	80,605	20	5	10	7	41,963	37,916	9	7
43. Simmer Deep	53.152	16	1	14	4	47,374	7.200	1	11
44. Spes Bona Tribute .	6,193	19	11	—		—	—	—	
45. Van Ryn	55,497	27	9	15	7	30,416	25,136	12	10
46. Village Deep	74,051	30	2	20	5	50,184	22,983	9	4
47. Village Main Reef ...	71.268	36	6	18	8	35,837	33,349	17	5
48. Vogelstruis Estate	16.566	24	6	20	8	13,414	3,179	4	10
49. West Rand Central ..	2,956	28	1	28	0	2,948	9	0	1
50. West Rand Cons.... ...	45,960	28	7	22	5	35,852	10,160	6	4
51. Witwatersrand	51.453	27	6	15	9	29,027	22,425	12	2
52. Wit. Deep	54.664	30	1	18	3	39.322	24,644	11	6
53. Wolhuter	37,796	26	2	18	2	26,226	11,105	7	8
Miscellaneous producers	15,123	—		—		—	—	—	
Witwatersrand totals	3,210,682	27	6	17	11	2054084	1101099	9	7
*Loss.				52 cos.		52 cos.	52 cos.	52 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

Outside Districts.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled	
	£	s.	d.	a.	d.	£	£	s.	d.
Heidelberg—									
1. Nigel	20,389	30	9	24	10	16,151	4,008	6	2
2. Sub Nigel	10,080	42	11	32	0	7,518	2,433	10	4
Barberton—									
3. Barrett	917	7	2	—		—	—	—	
4. Sheba	13,499	42	2	27	7	8,734	4.743	15	0
5. Worcester	5,518	18	3	12	6	3,793	1,725	5	8
Klerksdorp—									
6. Quest	3,318	16	3	15	4	3,042	276	1	5
Lydenburg—									
7. Ceylon Lydenburg ...	1,338	40	5	21	11	725	613	18	6
8. Glynn's Lydenburg ...	5,739	37	5	23	1	3.546	2,065	13	6
9. Transvaal G.M. Estates	40,413	53	5	21	11	16.196	23.230	31	6
Miscellaneous producers	22,465	—		—		—	—	—	
Total (outside districts)	123,676	36	2	22	9	59,705	39,093	14	11
				8 cos.		8 cos.	8 cos.	8 cos.	
Grand totals	3334358	27	8	18	0	2113789	1140192	9	8
				60 cos.		60 cos.	60 cos.	60 cos.	

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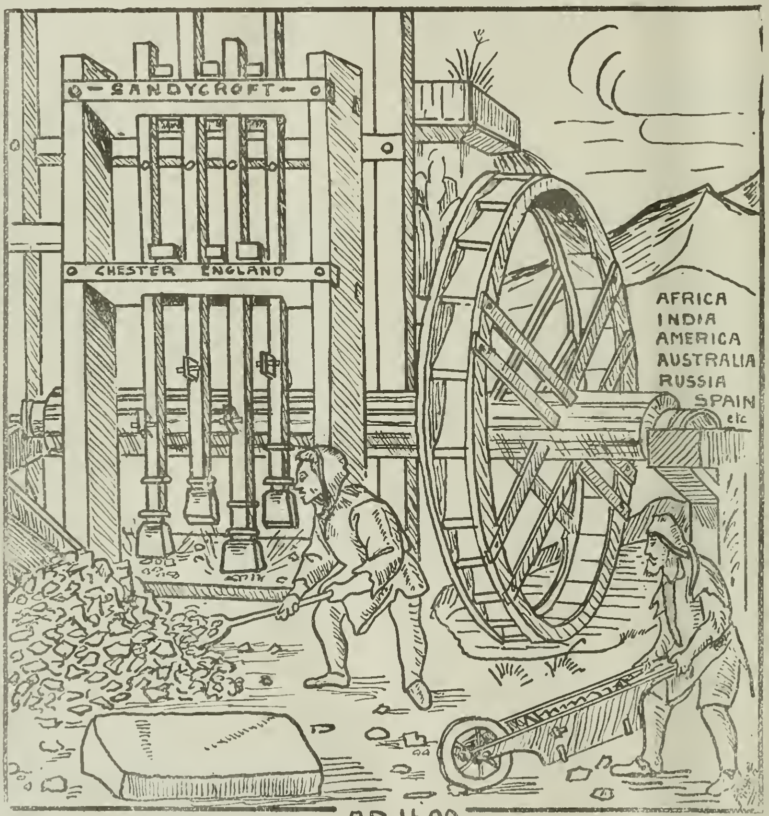

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Engineering Notes and News.

The Testing of Fans.*

A PLEA FOR STANDARDISED TEST CONDITIONS.

By John Watson, M.I Mech.E.

Fan tests that are presumably conducted and published in good faith vary so widely in their results, particularly in regard to efficiency values, that it would be well if the conditions under which fans are to be tested were standardised. The value of the results as a guide to the selection of a fan to work under given conditions, and to advances in fan design and construction, would therefore be considerably enhanced if the conditions of testing were known to be reliable. The objects of fan testing are, generally, to determine (a) the quantity of air per minute passed by the fan, (b) the resistance overcome by the fan, namely, the water-gauge, (c) the efficiency of the fan, and, in some cases, (d) the efficiency of the whole plant. In evidence of the divergence of practice in regard to measurement of the air and the water-gauge, the following stipulations are extracted from recent fan specifications, not with the view of criticising the stipulations themselves, but solely for the purpose of exhibiting the differences of opinion existing:—(1) The quantity of air and the water-gauge are to be measured in the upcast shaft. (2) The quantity of air and the water-gauge are to be measured at the pit-bottom near the separation doors. (3) The quantity of air is to be measured in the fan drift at a place specified, and the water-gauge is to be measured by a tube led into a box in the side of the fan drift covered by a perforated plate. (4) The quantity of air, the speeds, the horse-power in the air, and the brake-horse-power at the fan pulley, with varying water-gauges of 3, 4, 5, and 6 in. at constant equivalent orifice, must be stated. When conditions differing so much are laid down, and where such differences in actual practice in testing as have been referred to are possible, one need hardly wonder that the results of tests are not readily comparable. The writer submits, therefore, that the whole subject of fan testing requires careful consideration in order that conditions universally applicable may be devised, so that the results of tests which may be carried out under these conditions should be readily comparable. The writer would suggest the appointment of a committee to confer with the other Federated Institutes on this important subject. A long Paper dealing with the points which have just been raised, along with many others, was read in 1909 by the late Mr A. H. Stokes to the Midland Counties Institution of Engineers.* Mr. Stokes seems to have recommended that uniform testing conditions should be agreed upon, but the subject does not appear to have received the attention which it deserved.

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* Abstract of Paper read, April 12, before the Mining Institute of Scotland.

Use of Steel Points for Core-Drilling.

M. L. Martel, in an article that is appearing in the *Bulletin de l'Industrie Minerale*, furnishes an interesting account of the use of steel-pointed drills. The recent application of granules of steel instead of diamonds has shown that in many instances they offer advantages over old methods of boring. The principal advantage of steel granules is in the matter of cost, facility in obtaining bores of large diameter, and boring very hard rocks—such as corundum. It is in hard, broken rock that this method of drilling displays its superiority over the diamond drill. The difficulty with steel-pointed drills appears when the boreholes are far removed from verticality. Under favourable conditions the granules have penetrated 52 feet in 24 hours, but generally, in ordinary ground and moderate depth, the daily advance is from 16 to 20 feet. This mode of boring seems destined to be extensively employed.

A Business Change.

The business carried on by H. Barder & Co., electrical engineers, etc., at the corner of Loveday and Anderson Streets, Johannesburg, will, as and from the 1st June next, be taken over by the Rand Electrical Company. The commercial department of the new firm will be in the hands of Mr. A. Solomon and the engineering department will remain under the charge of Mr. G. R. Beith.

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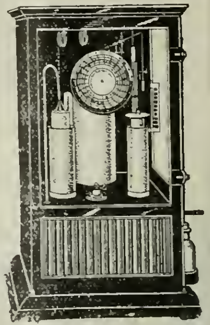

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Electric Power: Increase of Current.

In the issue of the "Government Gazette" dated 16th inst., the Rand Mines Power Supply Company have been granted licences to extend the Power Act of 1910. Owing to the completion of the electric generating station at Vereeniging, it has become necessary to provide for another transmission line therefrom to a new distributing station on the Robinson Central Deep Mine, and to rearrange the transmission lines between the various generating and distribution stations of the Rand Mines Power Supply Company and the Victoria Falls Power Company. These two companies are now working in unison, and for the sake of economy it has been arranged that the main transmission lines shall be constructed on poles which are to be the joint properties of these companies carrying their respective wires. As showing the immense increase in the use of electrical power on the Witwatersrand Gold Mines, the power to supply derived under licences has been increased as follows :—Rand Mines Power Supply Company, from 600,000,000 unites to 810,000,000 units; Victoria Falls Power Company, from 500,000,000 units to 600,000,000—increase, 310,000,000 units. To appreciate this increase it may be stated that a unit here represents one electrical horse-power operating for one honr. The increase of right to generate power has been increased as follows :—Vereeniging Station, from 20,000 kilowatts to 68,000 kilowatts; Simmer Pan, from 18,000 kilowatts to 42,000 kilowatts; Brakpan, from 12,000 kilowatts to 20,000 kilowatts; but in the "Government Gazette" it is notified that the Driehoek Station is being reduced from 3,000 to 1,000 kilowatts. At the same time the Victoria Falls Power Company had previously the right to purchase from the proposed generating station to be erected at Tweefontein, near Witbank, 130,000,000 units, and this right has now been increased to 250,000,000 units. There is also provision in the "Gazette" for an increase of machinery for compressing air by steam at Rosherville Station from 16,000 horse-power to 54,000 horse-power.

Wireless Telephony in Mines.

Great interest is being aroused in colliery circles in South Yorkshire at a series of experiments in wireless telephony which are being carried out at the Dinnington Main Colliery, and which it is hoped will lead to easier and safer communication in various parts of the mine. The inventor is a German scientist, and a German syndicate is installing the necessary apparatus at the mine. If the system is capable of all that the inventor claims for it, the results will be far-reaching, as it is stated a conversation can be carried on through 1,500 yards of solid rock. A Press representative who saw the chief engineer (Mr. W. D. Wallis) was informed it was quite true that tests are being made, but whether the system would enable one to communicate through 1,500 yards of solid rock or not he was unable to say. When the experiments had reached a more advanced stage, details would, he said, be available.

We have received from Messrs. Henry Pels & Co., specialists in punching and shearing machines, New York, Paris, Brussels, Berlin and Milan, their booklet, S. 4—1913.

Attention is drawn especially to deep gap punches, for which there is a great demand. The "steel plate" design meets conditions most perfectly. Punches with 70in. deep gap have been supplied by this firm, with a full guarantee against breakage of frame.

New Patents.

78. (1) Charles Harold Taylor, (2) Edgell Summers Stillwell Fabris, (3) Frederick William David Bartoch, (4) Montague Aitchison Parris.—Improvements relating to internal combustion engines.
79. (1) Jere Lester Wentz, (2) Robins Conveying Belt Company.—Improvements in supports for conveyor belts.
80. Joseph Thomas Freestone.—Improvements in or connected with charging air with sanitary or hygienic or aromatic vapour.
81. Samuel Cleland Davidson.—Improvements in or relating to centrifugal fans.
82. (1) The Morgan Crucible Co., Ltd., (2) John Edward Grant.—Improvements in or connected with brush holders for dynamo electric generators or electric motors.
83. Cyrus Robinson.—Improvements in agitating devices.
84. (1) Jens Andrews Johnsen Humberseth, (2) Teif Rnudsen.—Improvements in means for sharpening rock drills and the like.
85. (1) Robert Lafford Lowne, (2) Cyrus Robinson.—Improvements in and relating to processes for precipitating and separating metal from solutions.
86. Cyrus Robinson. — Improvements in filtering dehydrating machines.
87. Septimys Percy Rickstone.—A captive flying machine.
88. (1) Alexander Pearson, (2) Frank Maynard Hallowell.—An improvement for grinding and classifying graphite by dry air process.
89. (1) John Brookes Chadwick, (2) Peter Hollinshead.—Improvement in or relating to the working of gas producers.
90. Frederick Victor William Swanton.—Improvements in power producing apparatus.
91. Henry James Shedlock Heather.—Improvements in induction motors for driving winding engines and for similar services.

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THE WEEK IN THE SHAREMARKET.

Set-back Caused by Kleinfontein Strike and Peace Conference Delays—A Good Undertone.

The whole market has been easier this week owing to the strike at the New Kleinfontein and the delays in signing the preliminary peace treaty in London. The trouble with New Kleinfontein is still serious for that mine, and may be protracted indefinitely now that the men refuse to accept the management's complete "climb down." The company, of course, cannot entertain the demand for an eight hours' day from bank to bank, and if the men remain stubborn in their attitude, the position will become very serious. It may be hoped, however, that moderate counsels will prevail, and possibly by the time this appears, the tension may be over. The other restraining factor in the market, viz., the troubles between the Balkan Allies, has had a depressing effect on the London and Paris markets, but in this respect the outlook towards the end of the week seems brighter. All Rand stocks have been easier in consequence of these things, and the rise in Springs and State Mines has been checked. Main Reef Wests continue to be a weak feature, but seem now to have touched bottom. The Rand dividend outlook is, however, very favourable, and the declarations to be made in the next few weeks ought to have a good effect.

THE TIN MARKET.

Tins have fluctuated considerably during the week, and big business has been done in Zaaiplaats. Developments at the mine are said to continue very favourable and the price is still maintained in the neighbourhood of 52s. Rooibergs are firmer though below the best price realised last week. Swazis are strongly held, and as a dividend-paying investment are regarded as one of the most attractive stocks in the market. Rex Zaaiplaats are reported to have passed into strong hands, and may be heard of again.

THE DIAMOND MARKET.

Diamond shares suffered in sympathy with the general market this week, and have remained steady below last week's quotations. This section of the market is a most sensitive one, and reflects every phase of the moment. Frank Smiths remain a popular counter at a lower level, and news from the mine is eagerly awaited. Roberts Victor and Blaauwboschs have been steady, with Nationals easier. Crown Diamonds have been a firm feature and in a better market may become a very popular counter. Oranges eased off at the beginning of the week, but firmed up on some buying for London. Otherwise this section is featureless.

The *Financial News* says:—The diamond industry did not require the extra fillip that has been given to European trade by the practical settlement of the Near Eastern question, as all through the dark days of political unrest the market held up with wonderful firmness. Naturally, however, the pending conclusion of peace has further strengthened the tone. Under such influences as these, the offering by the London Diamond Syndicate of the high-class production of the Jagersfontein Mine was attended by instantaneous success. Owing to their quality, the Jagers' stones are always in great favour. Next week the Syndicate will market the output of the Bultfontein Mine. The Premier Company has also been showing during the present week, and has been able to sell very freely. The continuance of the rise in the prices of the lower qualities of diamonds is the outstanding feature of the trade.

	Friday, 23rd.	Mon., 26th.	Tues., 27th.	Wed., 28th.	Thurs., 29th.
African Farms	17 6B	17 9	17 3B	17 3	17 0B
Apex Mines	26 3	26 6B	26 3	—	26 0
Bantjes Consolidated ..	21 0B	21 3B	21 9B	21 0	21 0B
Benoni Consolidated ..	3 1B	3 6	3 1B	3 0B	—
Blaauwbosch Diamonds ..	112 6B	112 6B	112 6B	112 6B	112 6B
Brakpan Mines	—	80 6	80 6	78 0B	78 9*
Breyten Collieries	32 0s	32 0s	32 0s	32 0s	32 0s
British S.A.	—	—	—	—	21 0B
Bushveld Tins	0 9B	—	—	—	1 0s
Cassel Coals	—	—	14 0B	—	—
City & Subs (£4)	50 6B	50 9B	50 9B	50 0B	50 0B
City Deeps ..	65 6B	64 6	63 0B	62 6B	61 6
Cloverfield Mines	6 0B	6 4	6 3	6 1	5 10B
Clydesdale Colls.	—	8 0B	—	14 0B	—
Cons. Investment	21 0B	—	—	21 6B	21 0B
Cons. Langlaagtes	27 6	27 6	27 9	27 3B	27 0B
Cons. Main Reefs	19 3B	19 3	19 0B	18 9B	18 9
Cons. Mine Select.	14 0s	—	14 0s	14 0s	—
Coronation Colls.	16 0B	—	—	—	—
Coronation Freeholds ..	0 5B	—	0 5B	0 5B	—
Coronation Syndicate ..	3 6B	—	—	—	—
Crown Diamonds	9 0B	9 0B	9 0	9 0B	9 0B
Crown Mines	146 3B	146 3B	146 3B	145 0B	—
East Rand Centrals ..	9 6B	10 0	10 0	9 6B	9 6B
East Rand Coals (2/6) ..	1 9B	1 9B	1 9B	1 10	1 10
East Rand Deeps	—	2 4B	2 9s	—	—
East Rand Props.	55 0	55 0B	—	54 6B	54 0
East Rand Debs.	£95s	£95s	£95s	—	£92B
Eastern Gelds	1 8B	1 8B	1 10	1 8	—
Frank Smith Diam. ..	15 0	14 9	14 3	13 9	13 6
Geduld Props.	24 0B	26 0	25 3B	24 6	24 3
Geldenhuis Deeps	34 0s	—	—	—	—
Ginsbergs	27 6s	—	—	—	—
Glencoe (Natal) Colls. ..	7 0B	7 0B	7 3B	7 0B	7 0B
Glynn's Lydenburgs.. ..	—	18 0B	17 6B	18 0B	—
Government Areas	23 9B	26 6	25 3	24 3	24 0
Hex River Expls.	0 6B	—	0 6B	0 6B	0 6B
Jumpers	—	4 0B	4 0B	—	—
Jupiters	10 6B	10 6B	10 6B	10 6	10 3B
Kaalfontein D. (2/6) ..	0 4	0 4B	0 4B	0 4B	0 4B
Klerksdorp Props.	2 6B	2 6B	2 3B	—	—
Knight Central	12 3B	12 3B	12 0B	11 9B	11 9B
Lace Props.	3 8B	3 10	3 9	3 10	3 6B
Luipaardsvlei Est.	9 0B	9 3	9 3B	—	9 0B
Lydenburg Gold Farms ..	3 3B	3 3B	3 4B	3 3B	3 4B
Main Reef Wests	12 0B	12 3	11 3	11 0	10 0B
Messina Development ..	25 0B	—	—	—	—
Middlevlei Estates	—	1 2B	1 2B	1 3	1 1B
Modder B's	77 6B	79 6	78 0B	80 0s	78 0B
Modder Deeps	36 9B	36 6B	37 6	36 6B	36 3
Natal Navigation Colls. ..	15 0B	—	15 0B	15 0B	15 0B
New Beksburgs	—	—	1 0B	—	1 3s
New Eland Diam.	28 6B	28 0B	27 6B	—	—
New Era Cons. (5/-) ..	8 0	8 1	8 0B	8 0B	7 9B
New Geduld Deeps	2 6B	2 9	2 8B	2 7B	2 7B
New Kleinfonteins	22 9	22 0	21 3	21 6	21 6
New Modders	275 0s	275 0s	—	—	—
New Rietfonteins	—	6 0s	5 0B	—	5 9s
New Unifieds	16 0s	16 0s	16 0s	—	16 0s
Nigels	19 0B	19 0B	—	20 0B	—
Nourse Mines	—	38 0B	38 6B	38 6B	38 0B
O.F.S. & Trans. Dia. ..	2 0B	2 2	2 0B	1 10	1 10B
Premiers Def. (2/6)	—	252 6B	260 0B	—	—
Premier Pref. (5/-)	—	180 0B	180 0B	—	—
Pretoria Cement Co. ..	56 0s	56 0s	56 0s	53 6B	54 0B
Princess	6 6B	6 6B	6 6B	6 6B	—
Rand Collieries	—	7 6s	—	6 6s	6 3s
Rand Klips	1 10B	1 11B	1 10B	1 9	1 6B
Rand Nucleus	2 7B	2 8B	2 7B	2 6B	2 6B
Randfontein Deeps	4 6B	4 6B	—	4 9s	—
Randfontein Estates ..	28 9*	28 3B	28 0B	27 6B	27 6B
Roberts Victors	35 0B	37 0B	—	35 0B	—
Robinson Deeps	—	38 0B	—	—	40 0s
Rooiberg Minerals	38 0B	39 6	39 3	39 0	39 0
Ryan Nigels	—	3 6B	—	—	—
Shebas..	5 3B	5 3B	5 3B	5 3B	5 6s
Simmer Deeps	3 6	3 6B	3 6B	—	—
S.A. Breweries	—	40 0B	40 0B	—	40 0B
S.A. Lands	4 0B	4 0B	4 0	4 0B	3 10
S.A. Tin Mines	—	0 6s	—	—	—
Springs Mines	18 6	19 3	19 9B	19 6	19 3B
Sub Nigels	14 3	13 4B	14 3	14 0B	13 9B
Swaziland Tins	51 9B	52 0B	52 0	—	—
Trans. Coal Trusts	48 0B	49 3B	48 9	48 0	47 3B
Trans. Cons. Lands ..	—	53 6s	—	27 0B	—
Trans. G.M. Estates ..	—	—	51 0B	53 6s	—
Tudors	—	2 0s	1 6B	—	—
Van Ryn Deeps	33 0	33 3	32 9	31 6	31 0
Village Deeps	41 9B	41 9B	41 6B	41 0B	42 6s
Vogel. Cons. Deeps ..	2 0s	—	2 0s	—	—
West Rand Cons.	13 0B	13 0B	—	—	—
West Rand Estates ..	4 3	—	4 3	3 9B	—
Witbank Collieries	43 9B	43 6B	43 6B	43 6B	—
Witwatersrands	76 0*	76 0	74 6B	73 6	73 0B
Wit Deeps	63 3	63 9	62 9	63 0	—
Wolhuters	16 3B	16 3	16 3B	16 0B	15 9B
Zaaiplaats Tins	50 9	55 0	54 0	53 9	53 6

B Buyers. s Sellers.

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Finance, Commerce, and Industries.

S.A.N.U. Activity.

The South African National Union proposes to signalise the official opening of the Union Government Buildings at Pretoria next year by holding a big exhibition of South African products, manufactures, minerals and raw materials on a scale worthy of the greatness of the occasion. The South African Manufacturers' Association proposes to hold a similar exhibition at Capetown early next year, so that public opinion may be better informed of the actualities of the manufacturing industry in South Africa. It is only by public exhibitions of this kind that the real merits of the national work the Manufacturers' Associations are doing are brought before the public eye. The S.A.N.U. contemplates holding its exhibition in Pretoria about June next. The Agricultural Society has placed its ample grounds and buildings at the service of the S.A.N.U. free of charge. The Civic Associations of Johannesburg and Pretoria, and of the smaller centres in rural districts, will no doubt lend what assistance they can to make this undertaking a truly national affair. It remains with the producing and manufacturing interests to make the Exhibition the biggest thing of the kind ever attempted in South Africa. And in this connection prospectors and others in every part of the country can help by exhibiting samples of minerals of all kinds. It is desired that samples of every product the soil produces should be displayed. Manufactures of all kinds, art work, the handiwork of South Africans, patents machinery, etc., will be welcomed, and may be assured of an advantageous position in the Exhibition. Every indigenous thing of known commercial value, or likely to be of a character that may be utilised in the industries of the country, may be exhibited. The occasion lends itself to a great national exhibition of South Africa's natural resources, of its pastoral and agricultural products, its mining and commercial enterprise, its wealth and variety of raw material. And no effort will be spared to make the Exhibition in every way a fitting and adequate reflex of the actualities of South African life and industry.

* * * *

What we Import.

The following is a list of articles imported during the month of March which are capable of being produced in the Union:—

Chicory	239,579 lbs.	£2,099
Corn, grain and meal :		
Barley	3,868 lbs.	39
Beans and peas	1,070,126 lbs.	5,179
Malt	1,219,629 lbs.	9,319
Wheat	16,487,317 lbs.	152,965
Flour, wheaten	22,219,307 lbs.	95,557
Fruit :—		
Dried	151,687 lbs.	2,849
Bottled, tinned, etc	155,646 lbs.	2,617
Sugar and sugar products	2,244,817 lbs.	28,153
Tea	165,040 lbs.	20,396
Vegetables :—		
Onions	119 lbs.	1
Potatoes	75,182 lbs.	233
Dairy produce :		
Butter	140,951 lbs.	7,016
Butter substitutes	225,757 lbs.	8,461
Cheese	457,974 lbs.	13,943
Milk	1,677,443 lbs.	33,665
General farm produce :—		
Eggs	2,269,870 No.	9,816
Hams and bacon	443,504 lbs.	18,027
Lard	343,698 lbs.	7,531
Meats, frozen :—		
Beef	840,312 lbs.	8,150
Mutton	21,904 lbs.	297
Pork	1,000 lbs.	22
Meats, salted and cured, N.O.D.	5,562 lbs.	134
Meats, preserved	217,217 lbs.	8,166
Miscellaneous articles of food and drink :—		
Aerated waters	—	949
Biscuits	257,637 lbs.	5,272
Cakes	15,087 lbs.	595
Confectionery	412,744 lbs.	17,104
Jams and jellies	207,849 lbs.	3,895
Pickles and sauces	107,571 lbs.	3,355
Salt, common and table	2,008,428 lbs.	1,441
Vinegar	7,854 gls.	737
Total : Food and drink as above		£468,283
Miscellaneous articles, not food and drink :—		
Acetic acid	19 gls.	8
Candles	25,603 lbs.	395
Cement	14,461,520 lbs.	10,479
Cake and patent fuel (2,000lb. tons)	224 tons	252
Earthenware, including bricks	—	12,777
Furniture	—	47,734
Leather :—		
Saddlery and harness	—	4,912
Manufactures, N.O.D.	—	9,877
Unmanufactured	153,492 lbs.	12,237
Oils :—		
Castor	13,163 gls.	2,083
Linseed	41,166 gls.	4,210
Rope and cordage	1,792 cwts.	3,818
Soap, common	556,463 lbs.	4,632
Stone, marble and slate for building	—	1,942
Tobacco :—		
Unmanufactured	72,823 lbs.	3,438
Cigars	7,539 lbs.	3,745
Cigarettes	23,791 lbs.	6,266
Manufactured	6,085 lbs.	564
Vehicles :—		
Carts, carriages, wagons and parts, not motor	—	3,387
Total, miscellaneous, as above		£132,756
Grand total		£601,039

Rand Gold Mines.

Glencairn Main Reef.

One of the most interesting features in connection with the development of the older outcrop mines of the Main Reef series is the discovery of blocks of payable ore in portions of the properties in question, sections which were abandoned years ago! The Glencairn Main Reef is no exception to this general statement. A certain amount of exploratory work in the upper levels of the mine is still being carried out, and Mr. P. Richardson, who presided at the annual meeting of the company on Wednesday, mentioned the important fact that recently a block of ore above the average grade of the mine was encountered near the May Consolidated boundary. Mr. Richardson made another interesting statement in regard to the metallurgical operations. He said :—

> At our last annual meeting a shareholder drew attention to the comparatively high percentage of gold left in the residues after treatment of accumulated slime. It is well known that the treatment of accumulated slimes is more difficult than that of current slime. There would be no difficulty in reducing the gold contents of the residues, but to do so would entail the expenditure of a considerable amount of money for additional plant, and the working costs would also be increased. Taking into consideration that the life of the mine is comparatively short your directors consider that the benefit which might be derived from better extraction would not justify the necessary expenditure. I now beg to move the adoption of the reports and accounts.

Recent Development Values in the E.R.P.M.

Dealing with the question of the values disclosed by development work in the current year, Sir George Farrar, at the annual meeting, said :—" You are aware we encountered the main reef series in the Hercules vertical shaft at a depth of 4,236 feet. The values at this point were unpayable, but as the reef is a compact body, it is not too much to expect they will improve on further driving. The main reef leader was intersected about the same time in a crosscut 1,150 feet from the 3,000 feet level in this shaft, the published values being 93 dwts. over 13.2 inches. I may add that 90 feet of driving has been done subsequently, and the assay values are : Western side, 23.8 dwts. over 42 inches; eastern side, 2.4 dwts. over 42 inches. Recent values have just been given me, namely : Western side, 120 feet; 13.6 dwts., over 42 inches; western side, 127 feet; 16.5 dwts. over 42 inches. Eastern side shows no improvement. Driving in the meantime is being confined to the main reef leader, as this is the principal gold carrying reef in this portion of your property. Too much weight should not be attached to the development at either of the two named points. It is just as likely the ore tapped by the crosscuts may deteriorate as it is probable the reef values in the shaft may improve. In the other section of the mine the latest development values in the deeper workings are these :—*Driefontein Section* : The bottom 1,720 feet of driving discloses an average value of 6.2 dwts. over 42 inches. Very little driving is being done at this section, where development work is retarded, as already stated, till such time as the pumping installation is complete. *Angelo Section* : The two last levels have disclosed ore of good value. On the 23rd level the average value for 1,100 feet of driving is 6.3 dwts. over 42 inches. On the 24th level for 900 feet driven the value is 18.4 dwts. over 42 inches. *Comet Section* : This section has been in a poor zone since the end of the financial year, but the lowest, or 22a level, on which the reef was a week or two ago intersected, has disclosed main reef of an average value of 13.2 dwts. over 57 inches for 60 feet of driving. The other drives are now out of the poor zone. *Cason Section* : The values disclosed on this section show a slight improvement. As stated in the report, the reef is duplicated considerably in the bottom section of this mine. Generally speaking, the development exposure during the four months of the present year was on a par with that of 1912." 1912."

South African Mining Journal

REMOVAL OF OFFICES.

From and after the 1st JUNE next the Offices of the SOUTH AFRICAN MINING JOURNAL will be situated at Nos. 176 to 180, STOCK EXCHANGE BUILDINGS, Fox Street, Johannesburg—(2nd Floor).

MINING MEN AND MATTERS.

The death occurred last week of " Z[illegible] " Stevens, the well-known and popular Rand pioneer.

* * * *

Mr. A. S. Uhler, formerly manager for the Ingersoll Rand Company at Butte, Montana, has arrived on the Rand from New York, to take up the position of assistant manager of the South African branch of the Ingersoll-Rand Company.

* * * *

Mr. H. H. Webb and Mr. Leslie Brown, of the Consolidated Gold Fields, left for England this week

* * * *

Mr. Tillard, the manager at the City Deep, has been granted six months' leave of absence, and Mr. Percy Sherwell has been appointed acting manager.

Government Gold Mining Areas.

With reference to the strike of the reef in the south-east shaft at a depth of 3,580 feet, the secretary on the 27th cabled to the London office as follows :—" South-east shaft sampling completed, small fault runs across shaft. South of fault, 16·8 dwts. over 65·2 inches; north of fault, 16·1 dwts. over 45 inches; average over all shaft 16·5 dwts. over 57 inches. Publishing."

Gold in German S.W. Africa.

According to *Südwest*, the discovery of gold on the farm of Leo Metzler at Kniseb promises well. The ore lies in a quartz bed, and lumps the size of a bean have been found. The Deutsche Kolonial Gesellschaft has already staked eleven claims and private individuals nineteen claims in the neighbourhood.

Alleged Gold Thefts.

Agents of the Transvaal Secret Service are endeavouring to discover the heads of a " syndicate " which has been successful recently in smuggling gold to England, which is dispatched in the form of process blocks, says the *Stationery Trades' Journal*. The success of the thieves has been owing to the fact that a gold process block looks very much like a heavy " electro." It is stated that during the past twelve months South Africa has exported nearly £1,000,000 worth of the blocks to England alone.

Pilgrims Rest Activity.

The work so far done on the farm London, which, it will be remembered, was only proclaimed in January last, has been productive of good results, says the *Sabie News*. One five-stamp battery for the Loxton-Oldfield group has already been erected, and two more, we understand, are in the course of erection. The C.B.R. Gold Reefs, Limited, are pushing forward the work of opening up their mine very actively here. The reef, which is well defined, maintains its promise of giving good values. The Little Octopus Mine continues to show excellent returns, and we understand the last month's output was a good one, giving nice profits. The Burnham and Munro Syndicate had an excellent month, and are still maintaining their reputation of having the best five-stamp producing mill in the district.

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PROGRESS OF NATAL INDUSTRIES.—I.

Exhaustive Review of Many Promising Activities—Coal, Tea and Whaling.

FROM the annual report of the Natal Chamber of Commerce, we make the following extracts:—

PRODUCTS AND INDUSTRIES.

Thirty pages of the report are devoted to products and industries. In the following each product and industry dealt with in the report is named, and some sentences from the report are extracted:—

Coal.—There has been a decided falling away in the number of steamers calling only to bunker. Steamers have found remunerative charters elsewhere, and have not needed to the same extent as in recent years to come from West to East in search of profitable business. The export of coal has decidedly increased. This increase has been helped considerably by the introduction from August 1, 1912, of a rebate of 1s. per 2,000 lb. in the railway rate for coal shipped as cargo. The rebate will further stimulate export of Natal coal in 1913. Under the prevailing high freight rates the rebate of 1s. per ton has led to an increase of exports. It will not, however, suffice to command the trade or to increase it, should freight conditions relapse, as they probably will. Increased trade between the United Kingdom and Australia has led to a large demand for Natal coal for bunkering at Capetown. The export of coal from Durban to other Union ports was 270,314 tons in 1911, but in 1912 it rose to 402,967 tons, neutralising the loss in bunkers at Durban. This trade with Capetown is likely to continue good in 1913, though it is handicapped by the increase in sea freight. In 1911 the price of bunker coal at Capetown was largely governed by the sea freight of 6s. per ton deadweight (including loading at Durban). In 1913 the corresponding charge prevalent throughout the year will be 8s. per ton. The general scale of prices for coal for bunkering at Port Natal, free alongside ship, was from 13s. 3d. to 14s. 9d. per ton (2,240 lb.). Towards the end of 1912 the principal collieries were driven by the continued unsatisfactory financial results of operation to consider the best means of improving their position. Ten of the principal collieries agreed to co-operate under the name of "The Natal Associated Collieries." Better results are in consequence expected in 1913, not only financially, but also practically, in the actual working of the trade.

Coke.—The quantity of coke manufactured in Natal is between 7,000 and 8,000 short tons annually. The manufacture of coke was first started by the Natal Navigation Collieries, Hatting Spruit. They commenced producing in 1905 with the "Bee Hive" type of oven. They have now fourteen ovens, equal to a monthly production of about 300 tons. The balance of the output is supplied by the Maritzburg Iron Company, whose works are at Sweetwaters, and by the South African (Vryheid) Coke Company, each of which makes about 200 tons monthly.

Wool.—The quantity of wool exported through Durban continues to show a very considerable increase each year. The export for 1912 was 46,715,040 lb., value £1,453,855, compared with 38,289,525 lb., value £1,147,519, in 1911. There seems little doubt that not only has the number of sheep in the country increased considerably of late years, but the introduction of new blood and new and more up-to-date methods is also increasing the weight and value of the individual fleece.

Hides and Skins.—The export of all kinds of hides and skins from Durban during the year 1912 showed a very considerable increase compared with that of the previous year. The chief reasons for this increase were, firstly, the considerable diversion of Johannesburg hides and skins from the Cape ports to Durban, due to the enterprise of one of our companies; secondly, the increase of competition amongst Durban companies in the Pondoland hide business; and, thirdly, the regrettable mortality amongst stock, due to the severe drought, which lasted until well into November on the high veld. The increase in the export of hides was about 30 per cent., whilst that in the export of sheep and goat skins was about 60 per cent. The total weight of hides and skins exported during 1912 was 15,956,623 lbs., valued at £427,757 sterling, as against 11,477,405, valued at £290,403 sterling, exported in 1911. The year was marked by an extraordinary boom in the price of hides, which advanced about 4d. per lb. from January to November, only receding about ½d. per lb. in December. The highest price on record in the trade—15d. per lb.—was touched in London for the best hides. The causes of this boom were the comparatively short supplies of ox and cow hides throughout the world, and the generally strong demand for both heavy and light leather made from these hides.

Sugar.—The crop of 1913-14 is estimated to yield from 115,000 to 120,000 tons. Zululand will be an important factor in the increase, and the extra acreage under cultivation there and along the rest of the North Coast of Natal will more than compensate for the loss through drought on the South Coast. No actual damage to cane by the recent heavy rains is reported—indeed, the estimates of the crop will probably be exceeded as a result of those rains. The competition of Mozambique sugar in the Transvaal market is a serious factor for the Natal sugar industry. The importation into the Transvaal of Mozambique sugar, which was 600 tons in 1909, was 6,725 tons last year, and is expected to be much larger next season.

Maize.—Comparing the year 1912 with 1911, there was an increase in export of Natal-grown maize of 22,388 bags, but a decrease in export of Cape grown maize of 7,752 bags, and a total decrease in export through all the four principal Union ports of 183,701 bags. South African maize was over-exported in 1912, and during the twelve months ended February 28, 1913, some 12,700 tons were imported, approximately as follows:—From North America, 630 tons; from South America, 6,047 tons; from Mozambique (for Southern Rhodesia), 2,523 tons; and 3,500 tons of South African maize were re-imported. The necessary adjustments for importation being made, it appears that the net surplus of maize exported from British South Africa in 1912 was some 930,000 bags, compared with some 985,000 bags in 1911.

Bark.—In view of the low prices, it is not surprising that the planting of new areas during the year was on a small scale only. The growing of mealies or stock farming and dairying appear more remunerative than the growing of bark at recent prices. Now that tick fever can be prevented, it seems likely that a large number of farmers will turn their attention from growing wattle bark to raising cattle and dairying. Although the tonnage for 1912 as compared with that for 1911 increased by 6.8 per cent. the value decreased by 2 per cent.

Tea.—The tea industry of Natal cannot be called a live industry, if life is synonymous with advancement. No exact figures are obtainable, but the quantity of tea manufactured during 1912 is estimated to be some 250,000 lbs. short of the previous year, when it came to some 2,140,000 lbs. Planters did not feel justified in increasing their acreage under tea, but devoted their energies to sugar, which of late years has been a highly paying industry.

Spirits and Beer.—The following figures are given of the quantity of spirits and beer manufactured and of the Excise revenue collected in Natal:—

	Proof gallons.	
Spirits.	1912.	1911.
Total manufactured	463,053	420,240
Removed into general consumption within the Province	94,632	91,333
Removed to rectifiers and compounders	14,378	10,496
Exported by sea	135,547	168,063
Exported overland	18,493	18,207
Methylated	173,084	152,023
Methylated Spirits—		
Total methylated	173,084	152,023
Entered for consumption in the Province	35,312	31,093
Exported by sea (to Cape Province) ...	51,717	42,224
Exported overland	80,193	78,443
Beer.	Liquid gallons.	
Removed into home consumption	915,554	824,874
Exported to the Union	199,593	181,946
Value	£18,589	£16,951
Excise revenue—	1912.	1911.
Duty on beer (4d. per gallon)	£15,260	£13,731
Duty on spirits (9s. per gallon)	48,082	44,763
Other receipts	238	11
Total Excise revenue of the Province	£63,580	£58,505

Whaling.—During the year 1912 there were twelve whaling companies operating on the South and East Coasts of Africa, mostly on the East Coast. The five Natal companies captured 984 whales last year; that is, 31 less than the three companies took who were operating off Natal in 1911. The number of whales landed at the Bluff in the last four years were:—In 1909, 155; in 1910, 531; in 1911, 1,015; and in 1912, 984. The output for 1912 of the Natal companies was 6,666 tons of oil, 2,900 tons of fertilisers, and 50 tons of "finners" (the whalebone of the "humpback" variety of whale), valued at £110,000. The output for 1911 was 7,500 tons of oil, 3,000 tons of fertilisers, and 60 tons of "finners," valued at £145,000. Although there were more companies operating off Natal in 1912 than in 1911, the number of whales captured was less, and the large profits made by individual concerns in the preceding years were not maintained.

(To be continued.)

The Meyer and Charlton.

Revenue, £98,297 14s., or 6s. 9·51d. per ton from 12,044 tons milled; costs, £38,451 4s. 11d., or 18s. 3·65d. per ton; profit, £59,846, or £1 8s. 5·86d. per ton; yield, from mill 9,647·59 ozs., from cyanide 13,526·95 ozs.; expenditure on capital account, £2,011. The working profit shows an increase of £5,059 17s. 3d. over that for the previous quarter. The installation of the new Pearn pump at the 19th level is being proceeded with.

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Automobile Notes.

The annual report of the Roads Improvement Association of Great Britain contains the following interesting note: It is evident that the modern hard road surface suitable in every way for mechanical traction is not so suitable for horses shod as they are at present, and steps that can usefully be taken to adjust this difficulty have been occupying the attention of the Association for some time. The calkins fitted in horses' shoes in various parts of the country, it is stated, cause serious damage to waterproof road surfaces. The Association held a conference with representatives of leading horse-owner interests, and discussed with them a suggestion that a new type of horse shoe should be evolved that would afford the horse the necessary foothold upon the modern waterproof road surfaces, and at the same time minimise the puncturing action of the calkin. The Association proposes to offer a prize or premium for a new type of horse shoe that will meet modern road conditions satisfactorily, and a detailed scheme is being prepared in consultation with horse owners.

* * * *

The highly novel and interesting fuel consumption trial organised by the Herts County Automobile and Aero Club recently was contested by nine motor cars and two motor cycles. The choice of fuel was left entirely to the contestants. The winner was to be the driver who covered the greatest mileage on his allowance of fuel. The quantity allowed each vehicle was based on a sliding scale at the rate of 1½ pints for each 600 lbs. of running weight. The result was as follows: 20 h.p. Vauxhall did 16·8 miles, using Shell II., equal to 33·6 miles per gallon; 12 h.p. Rover, 16·6 miles, with benzol, equal to 33·2 miles per gallon; 12 h.p. Rover, 14·4 miles, with half benzol, half shell, equal to 28·2 miles per gallon; 20 h.p. Vauxhall, 13·6 miles on Shell, equal to 24·6 miles per gallon; 12 h.p. Belvige, 12·1 miles, on Phoebus paraffin, equal to 28·6 miles per gallon. The other competing cars were: 16-24 h.p. Unie, 12-16 h.p. Vauxhall, and 10-12 h.p. Humber. Only one motor cycle finished (the other having lost his way), with 7·5 miles on his allowance of Pratt, equal to 60 miles to the gallon.

* * * *

The latest motoring road book of Great Britain is one issued by the *Automobile Journal*. It is described as a compact work full of the information that is essential to the motorist, and ignoring that mass of unnecessary detail which goes so far to discount the value of many of the more ambitious works of the kind. One striking departure is the form in which the route maps are presented with a diagram of the contour running parallel with each road plan, with which it has been carefully brought into line, so that corresponding points lie opposite to one another. For convenience sake, each route is completed on one page, irrespective of distance, so that there need be no turning over of pages for reference. The work covers the whole of the main roads of Great Britain, and this, it is announced, will be followed immediately by maps of a more localised and detailed character.

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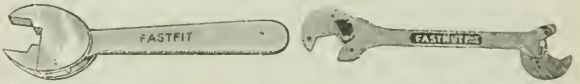

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1st Targa Florio (640 Miles) on CONTINENTALS
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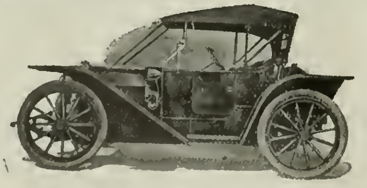
The National Society of Chauffeurs, in the prosecution of their Parliamentary campaign, have found it expedient to expunge from their programme the clause which seeks to impose liability on the owner for excesses of speed when the latter is in the car. This has been done on the advice of the Hon. Arthur Stanley, vice-president of the Society. The chairman pointed out, when the matter was last under discussion, that during the past three years the Society had, by deputations to responsible Ministers, and by corresponding with every member of Parliament, presented the whole of the Parliamentary campaign, with the result that only a few members of Parliament had promised to support the entire programme, while there had only been one objection to the justice of the cancellation of endorsements on licences, therefore the advice given by the vice-president, to concentrate their efforts in obtaining the latter point, seemed good advice.

* * * *

The Secretary of the R.A.C. of South Africa has received a notification from the Transvaal Automobile Club that the competition for the Schlesinger Trophy will take place on the 31st May and 1st June next. Under the rules, this trophy is open to members of any Automobile Club in South Africa, and the Secretary of the Transvaal Club writes that he will be happy to receive entries from Club members, and assures them of a hearty welcome to Johannesburg.



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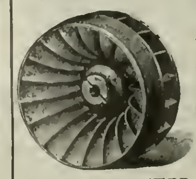

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IMPORTANT NOTICE.

NOTICE IS HEREBY GIVEN THAT THE LONDON OFFICE OF THIS JOURNAL, IN SALISBURY HOUSE, HAS BEEN CLOSED. THE ENGLISH AGENCY OF THE PAPER HAS BEEN ENTRUSTED TO THE ARGUS PRINTING AND PUBLISHING COMPANY, LIMITED, BYRON HOUSE, 82-85, FLEET STREET, LONDON, E.C. OVERSEA ADVERTISERS AND SUBSCRIBERS ARE KINDLY REQUESTED TO PAY THEIR ACCOUNTS AND SUBSCRIPTIONS TO THE ARGUS COMPANY, WHO WILL GRANT RECEIPTS ON OUR BEHALF. PAYMENTS MADE TO ANY OTHER PERSON OR PERSONS WILL NOT BE RECOGNISED.

THE LOCAL OFFICES OF THE JOURNAL ARE NOW SITUATED AT 176-180, STOCK EXCHANGE BUILDINGS, FOX STREET (2nd FLOOR).

Notes and News.

The Strike.

The stupid and deplorable strike at the New Kleinfontein remains at the time of our going to press in much the same position as it did last week. It is admitted on all hands that the men's demands have been conceded, and the original and ostensible cause of the trouble removed. But since the directors of the company refuse to treat with the Strike Committee, the paid organisers of the men, the mandarins of the Trades Hall refuse to permit the men to go back to work, and raise all sorts of vague, false and impossible issues, such as the cry for an eight hours' day "from bank to bank." And so the game goes on. At the moment of writing, however, there are signs that the men are becoming heartily sick and tired of idleness, and a settlement seems drawing appreciably nearer.

* * * *

Coroners and Inquests for the Rand.

Owing mainly to the powerful influence of Mr. J. F. X. Merriman, the Government, it is understood, intends appointing a Coroner for the Rand, and re-establishing the practice of holding inquests. For the post of Coroner there are already several "likely" candidates of varied legal experience, but it is hoped that the position will be given to one who has a thorough practical acquaintance with mining conditions on these fields. The name of Mr. W. Moses is freely spoken of in this connection, and certainly no better appointment could be made.

* * * *

The Van Ryn Deep.

At the Van Ryn Deep the management still await delivery of certain small but essential portions of the new equipment, which have arrived in Africa but have not yet been received at the mine. It is, however, confidently expected that the parts in question will be received within the next week or two, and as soon as they are installed a commencement will be made on " tuning " up the plant—that is to say, different sets of stamps will be dropped separately and the equipment generally will be given short trial runs. The formal commencement of crushing operations is only a matter of two or three weeks now.

*   *   *   *

The New Rand. We are in receipt of a copy of Mr. A. R. Sawyer's report on No. 17 borehole of the New Rand, Ltd., which has been forwarded to us at the request of the London directors of that concern. In this Mr. Sawyer reports completion of the No. 17 hole and selection of the site of No. 18. The document contains a lengthy and detailed account of the strata traversed, including " 34 feet 3 inches of lower Witwatersrand strata," but the hole " failed to intersect the Main Reef series " proper. The failure is ascribed to reversed faulting. Better results are anticipated from the eighteenth hole. In the opinion of Mr. Sawyer, " it is most unlikely that the earth movements which No. 17 borehole has exposed will have still further disturbed the formation to the south, and we may now fully expect to intersect our long and patiently waited for Main Reef series in No. 18 borehole."

*   *   *   *

Messina Copper. Construction work at the Messina Mine has reached an advanced stage, and the fine new plant is fast approaching completion. It is expected that next month the company will be able to make a smelt which will be the first really large copper smelt carried out in South Africa, and the operation will no doubt attract much attention not only locally but in technical circles in other parts of the world as well. At an early date construction trains will be running to Blaauwkop, about 25 miles from the mine and by September or October next the railway should be completed right on to the camp.

*   *   *   *

Miners' Training School. The report of the Labour Department contains an important reference to the Mines Training School at Wolhuter. It denies that any cases of miners' phthisis had been discovered among the apprentices at the school. According to the Labour Department report this statement appears to have been made in a public discussion, and, though satisfied that there was not a vestige of truth in it, the department considered it advisable to have all the apprentices medically examined, with the result that not one was found to show the slightest symptoms of the disease. Moreover, the general health of the apprentices is certified to be exceptionally good.

*   *   *   *

The Value of Ore Reserves. At the West Rand Consolidated annual meeting held a few days ago Mr. George Nathan took steps to remove a false impression, under which an English shareholder had been labouring in regard to the average assay value of the ore in reserve. The enquirer inferred that ore reserves of a value of 6·02 dwts. per ton will yield a recovery of 24s. as compared with 23s. 10d. per ton on a basis of 60,000 tons per month. As Mr. Nathan pointed out, the board will be exceedingly surprised if the working costs are anything like 23s. 10d. per ton when milling 60,000 tons monthly He was also able to reassure the enquirer that the figure of 6·02 dwts. is the mine value only, that is, before sorting, and that the milling value is consequently appreciably higher. The question and the reply appear to us to revive the whole subject of the method of declaring ore reserves. As we have remarked on several previous occasions, there is a woeful lack of uniformity prevailing amongst the different mining companies in regard to the method of declaring the quantities and contained values of ore tonnages blocked out and available for the battery, and it is scarcely to be wondered at that lay shareholders should fail to appreciate the fine points in this matter. Were all mines to declare ore reserves in terms of milling tons, *i.e.*, after deducting the probable amounts to be rejected as waste from the mining tons total, and state the estimated recovery from mill and cyanide works in terms of shillings and pence shareholders not conversant with the intricacies of mining would be the better able to realise the value of the tonnage blocked out and available for milling in the mine in which they may be interested.

*   *   *   *

Advance Development. Mr. H. F. Marriott, the consulting engineer of the Central Mining and Investment Corporation, in the course of his report, works out the periods which various associated mines are ahead of their mills, as under:—Bantjes, 2·24 years; City Deep, 3·93 years; City and Suburban, 1·84 years; Crown Mines, 4·6 years; Durban Deep, 2·7 years; Ferreira Deep, 2·15 years; Geldenhuis Deep, 2·04 years; Modder B., 5·93 years; New Heriot, 3·64 years; New Modder, 5·93 years; Nourse Mines, 2·56 years; Robinson South Reef and Leader, 1·68 years; Robinson Main Reef, 1·72 years; Rose Deep, 3·75 years; Village Deep, 2·75 years. The durations given are calculated on the basis of tonnage blocked out and that to be rendered available by current development, and on existing crushing capacities.

*   *   *   *

The Corner House and Rhodesia. Evidently the Central Mining and Investment Corporation has no very great faith in Rhodesia, or at any rate finds that other countries hold out better prospects of profit. Mr. Eckstein in his speech made but a scanty reference to the territory lying across the Limpopo, and the report tersely dismisses the country in the sentence: " Operations in Rhodesia have been terminated, and the company's interests there are small." One would infer from the report that Trinidad oil properties and Columbian alluvial are regarded by the leading South African House as being more attractive than such propositions in Matabeleland and Mashonaland as are not already held by controlling groups.

*   *   *   *

Eckstein Ore Reserves. Probably the most interesting feature in the comprehensive and informative report of Mr. Hugh F. Marriott, the consulting engineer of the Central Mining and Investment Corporation, on the operations of that gigantic concern and its subsidiaries last year is the statement regarding the aggregate ore reserves of the group. We have in one or two recent issues dealt at some length with this aspect of Witwatersrand mining practice, and the statement by the chief engineer of the group that in the mines controlled by that concern the ore reserves have a value of fifty-five and a half millions sterling serves to corroborate and amplify the figures published by us, which brought home to one the enormous strength and stability of the industry. Mr. Marriott in his official document writes:—The ore reserves of the group as calculated at the close of the financial year of each company are summarised as follows: (1) Ore blocked out and available for stoping, 32,512,087 tons (equals an average of 3·20 years' supply); average gold-content per ton, 31·3s. (2) Ore in sight to be rendered available for stoping by current development, 3,290,168 tons (equal to 0·32 year's supply); average gold-content per ton, 25·2s. Total, 35,802,255 tons; 30·8s. This represents an average of 3·52 years' supply for the mills on measured ore reserves alone. In addition to these reserves, a further supply, amounting in the average to about 15 per cent. of the total output, is obtained from development rock and reclamation work. Close attention has been given on the mines of the group during the year to mining as little waste rock as possible—that is, to confining the stope widths as nearly as is practicable to the actual widths of the profitable ore bodies. This enables the proper inclusion in profitable reserves of bodies of ore which, with less careful mining, would remain below the profit limit. The average rate of sorting for 1912 was 14·08 per cent. of the total tons mined. The ore reserves in Classes 1 and 2, therefore, represent 30,761,298 milling tons of a calculated gold-content of 35·2s. per ton.

*   *   *   *

The Durban Deep's Year. An increase in dividend of 5 per cent., an improvement in the financial position, record development footage, record mill tonnage, and a record profit were the outstanding features of the excellent statement made by Mr. H. Eckstein at the Durban Roodepoort Deep meeting on Thursday. Another particularly satisfactory feature of the year's work has been that the Main Reef, which at this mine, generally speaking, cannot be looked on to anything like the same extent as so consistent a gold carrier as is the South Reef, contributed 36 per cent. of the total tonnage mined. Profits were not adversely affected thereby, a fact which, as Mr. Eckstein remarked, "speaks well for the care and attention shown in the extraction of this reef body."

* * * *

Durban Deep's Past Troubles.

The management of the Durban Roodepoort Deep Company has had no easy time of it during the past year. Troubles in connection with the shafts have had to be remedied. It may be recalled that the 1911 operations were seriously hampered by "crush" in the No. 2 and No. 3 shafts, and whilst the chairman admitted it cannot be stated that no further crush need ever be feared again at any point, there is no doubt that the steps which have been taken with a view of securing them against any important movement have been successful, and it is hoped that no more serious trouble will be experienced in this direction. In regard to water troubles, Mr. Eckstein remarked: It was not to be expected that we should be free from water troubles till the new pumping plant had been in commission for some little time. Owing to the periodic flooding of the lower levels at No. 2 and No. 3 shafts, no advance was possible with the 12th (main concentrating) level in that section of the mine, and development operations generally were seriously handicapped in the area served by these shafts. On the other hand, in the east (No. 1 shaft) section substantial progress has been made with this main level, which has been advanced 633 feet from this end during the year. Every effort is being made to hasten the completion of the pumping scheme, as this will have a most important bearing on the whole development position. I am glad to be able to state that it is hoped that by the end of this month sufficient progress will have been made to tackle effectively such portion of the mine water as is at present interfering with development work at No. 2 shaft. The chairman also made reference to a scheme for the development of the mine below the 13th level, which may be taken as the plane of concentration and from which, as a base, all future development work will proceed.

* * * *

Costs at a French Gold Mine.

Basing its calculations on information afforded at the last annual meeting of a well-known company working an auriferous quartz and mispickel deposit, the *Echo des Mines* gives the following particulars for the year 1911: Ore broken, 96,870 tons, averaging 7·716 dwts. of gold per ton; crushed ore amalgamated and cyanided, 97,245 tons; fine gold obtained, 35,884 ozs.; fine silver recovered, 4,823 ozs.; refined arsenic, 155 tons; the extraction equalled 92·1 per cent. of the contained gold; the total cost of mining and reduction was £74,452. The cost per ton was 15s. 4d., to which must be added 1s. for administrative expenses, making a total of 16s. 4d.; of this latter sum 10s. 4d. represents mining and raising the ores, and 6s. the reduction to fine gold. The final tailings still retain two-thirds of a pennyweight. From these figures it is manifest that quartzose auriferous ores enclosing 4 dwts. per ton may be considered payable. In the present case the profit made was about 16s. per ton of ore treated. Comparing these figures with those of the Witwatersrand, where in 1912 27,389,872 tons were crushed for a total cost of 18s. 8d. per ton, as compared with 18s. during 1911, our contemporary sapiently observes:—"The cost per ton in France was 2s. 4d. per ton lower than in the South African goldfield, and is the lowest yet known for the reduction of combined gold." The last statement is obviously nonsense. It is, of course, unfair to compare the costs of one small property with the average for the whole Rand. The costs of several Rand companies are, of course, lower than those of the French mine mentioned.

TOPICS OF THE WEEK.

THE ALBU GROUP.

THE annual meetings of the companies of the Albu group are separately reviewed at some length elsewhere in this issue, but a word may be said here regarding the general results. The Meyer and Charlton is the bright particular unit in the group, and the results won during the first five months of the current year more than maintain the promise of the excellent annual reports for 1912. Ore reserves, recovery and financial position show a continued improvement, and the mine must have helped greatly to reconcile the General Mining people to the disappointments of the past year in other quarters. The West Rand Consolidated also makes a satisfactory showing, and the ore reserves have been considerably increased both in value and extent. The policy of the board is gradually to double the present crushing capacity of the reduction and treatment plant; that is to say, to increase it up to 60,000 tons per month, which will or should bring about a substantial reduction in working costs, with nearly a corresponding increase in profits. The Aurora West also reveals a considerably improved position. Results obtained during the current year show that the yield per ton of the ore treated has risen from the average of 24s. 9d. for last year to a recovery varying from 26s. 1d. to 28s. per ton. This is due to some extent to an improvement in stope values, but also to a re-arrangement of sorting methods instituted in the latter part of last year, which enabled the mine to increase the percentage of waste rock sorted out on the surface from approximately 15 per cent. of the total ore hoisted to 20 per cent. What Mr. Nathan calls the main essentials of a successful proposition are certainly shown. The profits have steadily grown, and the improvement is being fully maintained; the ore reserves have appreciably increased, without any diminution in value, to an equivalent of more than three years' supply ahead of the mill; as regards the "life" of the mine, the directors have satisfied themselves that this is likely to be a long one. The only other really important question now unsettled is the liquidation of the company's liabilities for advances made by the General Mining and Finance Corporation—and this must wait upon the advent of better markets. At the New Goch the results obtained from gold production for the first four months of the current year reflect an improvement on the figures for the corresponding period of last year, but still fall short of anticipations. A summary of the whole of the recent development figures gives an average value of 5·8 dwts. over a stoping width of 72 inches for the 845 feet sampled or approximately three-fourths of a dwt. above the average value of ore reserves at the 31st December last. An encouraging feature in connection with this development is that in the case of the lowest (*i.e.*, 16th and 17th) levels the values have been steadily improving in both east and west sections as the drives get further away from the shaft: in the course of the next two or three months a large proportion of this ground will be available for stoping. As regards future development work, arrangements have now been completed for facilitating more rapid sinking in the main incline shaft, and it is expected that the 18th level will be reached by July next. The real disappointment of the year is, of course, the Cinderella. Mr. Nathan's cautiously worded statement puts the position as fairly as possible, and may be quoted *verbatim*. He said:—

> It is obvious, however, that the development scheme alone, apart from increased treatment plant, will entail an aggregate expenditure well in excess of the funds which your company at present possesses, and which, after excluding such liquid assets as investments, stores, sundry debtors and payments in advance (but providing for all current liabilities, including debenture interest accrued, machinery on order, and the purchase price of the claims to be acquired from the E.R.P.M.), amounted at the end of last month to £87,000. The completion of the work outlined will, therefore, depend on the arrangements which your Board may be able to make for financing the company. I am not in a position to make any definite statement on this point at the present time, and I can only state my personal feeling that I trust some satisfactory means will be found of supplying the necessary funds to develop the property to an extent which will allow of the increase of the reduction works to a capacity commensurate with the large area and equally large possibilities of the mine.

On the important question of closing down the mine temporarily, Mr. Nathan, after speaking of the difficult working conditions, remarked:—

> As it is inadvisable to continue crushing high-grade ore without a profit, your Board has instructed the company's engineers to examine the mine with a view to ascertaining whether it is possible to reorganise working conditions in such a manner as to bring about the necessary reductions without interfering with milling, or whether it is advisable to suspend milling for a period, during such possible reorganisation. Pending the receipt of the engineers' report on their investigation, it has been decided to give provisional notice to those of the present employees whose services would not be required during the suspension of crushing, in order that, in the event of the latter policy being adopted, no unnecessary expenditure need be incurred.

The Roodepoort United has also had a disappointing year, and the tale of its troubles is set out in detail in Mr. Nathan's speech. Recent development, however, shows better values below the faulted and broken ground, and should these good values continue the prospects may much improve. Rand Collieries continue to await a better money market for reconstruction and a fresh start. The group, it will be seen, has had a chequered year, but the outlook on the whole is satisfactory.

THE CITY DEEP.

Of the nine mining companions of the Corner House group that held their annual meetings this week, chief interest, of course, attaches to the City Deep and Crown Mines. As the latter meeting is being held as we go to press, it is impossible to comment on it in this issue, beyond congratulating the Chairman, Mr. Samuel Evans, on the excellent progress shown. The City Deep meeting held on Thursday provided the Chairman, Mr. R. W. Schumacher, with an opportunity of giving the lie to the many rumours recently afloat regarding the mine. These rumours he characterised as "ridiculous, mischievous and dishonest." His speech from the chair will be welcomed by shareholders as a very frank and informing pronouncement. Answers to all the questions that have been agitating shareholders were given freely and in detail. The figures quoted by Mr. Schumacher showed that the development values are everywhere most encouraging, and that there can be no doubt about the great value of the mine. Shareholders will, however be anxious to know how soon better profits can be expected. Mr. Schumacher's answer is, this will depend entirely on the supply of native labour. The mine is to-day in a position to furnish 60,000 tons monthly for the mill were labour available. Mr. B. Madew, the consulting engineer, is quite definite on this point. Given an underground force of five thousand natives, as compared with three thousand four hundred and fifty that the mine has to-day, the full mill could now be kept running. "At the same time," said the chairman, "I must make it clear that we are not in a position to-day, and would not be even with more labour, to work the mine to the best advantage. We have not yet sufficient stope faces to work the mine on single shift, which is the ideal state of affairs and has been attained by many of our older mines. Our consulting engineer reckons that the mine should be able to supply the whole mill output on single shift only within a period of fifteen months or so; but already before this date the condition of the mine will be steadily improving, and the number of stope faces is expected gradually to increase after January, 1914." Mr. Schumacher dealt at length with the efforts being made to improve the ventilation of the mine. He went on to explain that the mining policy during the near future will be to push development at all important points, to increase the number of stope faces, and to place the mine in so strong a position that it will thereafter, it is hoped, easily hold its own and never be likely to go back. The area that lies to the north of the present shafts and is estimated to contain at least 4,000,000 tons of ore, will now be developed rapidly with the help of the second and fourth level cross-cuts, the latter of which has just been completed. The ground that lies to the south of the shafts will be opened from two main points of attack. The first is through the incline shaft that is being sunk from the foot of the western vertical shaft. It is intended to push down this incline with the utmost speed, and it ought to be possible to open up a new level, say every five months, the levels being approximately 250 feet apart. If this work is done, as it is intended it shall be, and winzes are simultaneously pushed down energetically from the existing lowest workings it should be possible during the near future to strengthen the position of the mine very greatly. The other point of attack will be from the eastern vertical shaft which, for financial reasons, was stopped 800 feet before it reached the plane of the reef in July, 1908. Sinking has now been restarted at this point. On the general policy, Mr. Schumacher added: "From what I have told you, you will gather that it is our intention during the next eighteen months, or so, to complete work which will place the whole mine development in an exceptionally strong position. I am sure shareholders will agree with me that this policy should be steadfastly carried out, and that we should not hesitate or swerve from it, at least from its main outlines, even if we are faced with difficulties in the meanwhile. I mean that even if there should be acute temporary shortages of labour it will be right for us to continue to work for the big thing that is going to put our mine in a strong position comparatively soon. We must get past the period when we have to be making constant excuses about our working costs being too high or our working profits too low. We must attack the fundamental obstacles that lie in the way and remove these once and for all; afterwards we shall have comparatively easy sailing and we shall be able to show results worthy of the City Deep mine." His summary of the general position leaves nothing to be added. All the titles of the company are perfect. The ore reserves stood at 2,123,650 tons, worth 8·7 dwts. on the 31st December, 1912. It is of interest to note that only three mines on the Witwatersrand fields have ore reserves of higher value and these mines are working at much shallower depths. The mine development continues to expose ore of high grade, thus thoroughly establishing the great value of the property. The mine is in a better position to-day than it ever has been, and could supply the full mill given the necessary supply of unskilled labour. The underground conditions will continue to improve, and the increase in the number of stope faces should be rapid after the conclusion of this year. Within eighteen months or so the mine should be in a very strong position in every respect and capable of crushing a very large tonnage under favourable conditions. The proposed sale of 15 claims will materially strengthen the cash position of the company, and the bulk of net working profits will be available for distribution to shareholders in the form of half-yearly dividends. Mr. Schumacher said that a dividend of 10 per cent., or 2s. per share, would be declared in the course of a few days for the half-year ending the 30th June. It will be seen that the City Deep chairman successfully discharged an unusually difficult task by taking the shareholders entirely into the confidence of the directors without reservation and we can imagine no better way of surmounting the initial troubles of the mine than the bold and courageous policy that has now been adopted.

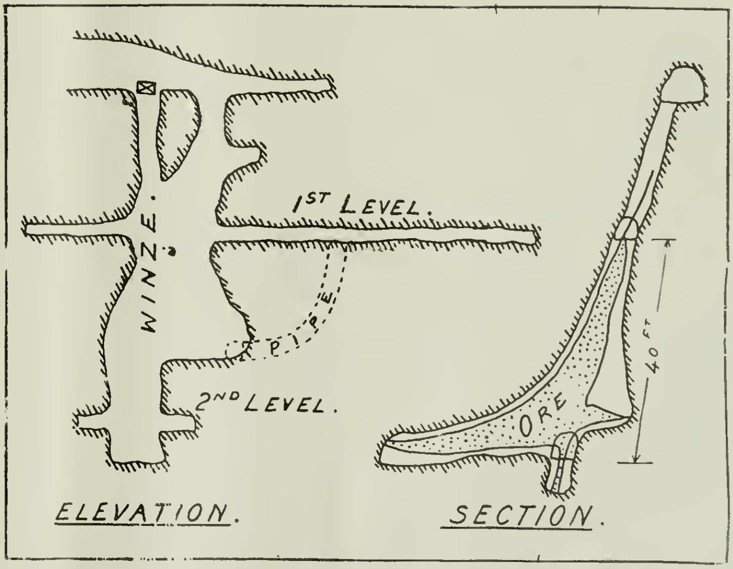
THE POSITION AT ZAAIPLAATS.

The New Strike in No. XIII.—Fissure and Lode Theories—Tentative Explanation of the High Values.

The remarkable advance in the price of Zaaiplaats shares during the past few weeks is undoubtedly to be mainly attributed to the marked improvement in the ore reserve position of the mine and to the more encouraging aspect of things generally that have resulted from the change of conditions in the now famous pipe No. XIII. To no small extent, also, what may be termed the rehabilitation of the mine in popular estimation is due to the cautious, and at the same time progressive, policy which has been adopted since the appointment of the present manager, Mr. A. Gilbertson. At no time since the commencement of the operations of the company, has its condition been so sound and promising as it is to-day. A properly regulated economy is apparent in every department, advance development is being strenuously carried out, and the working faces are giving satisfactory exposures.

The No. XIII. Pipe.

For various reasons the discoveries which have been made in the No. XIII. pipe are of considerable importance. In the first place they have resulted in the opening up of a large reserve of high-grade ore. Owing to the very rigid method of estimating tonnages at Zaaiplaats, the quantity of material that may already be regarded as ore in sight is not recorded as an actual asset in the same way that blocked out ore is valued and registered upon the Rand. In the last quarterly report the directors state that the area of payable face exposed to the 30th April, 1,056 square feet, namely, averaging 3 per cent. metallic tin, "does not include the ore in No. XIII. section, which presents all the difficulties of estimation common to abnormally high-grade bodies." A safe estimate, probably, would be that between 4,000 and 5,000 tons of rich ore are indicated as far as development has gone at the lower extremity of this pipe. A little more than twelve months ago the No. XIII. section was the most prominent in the mine, not so much by reason of the fact that it was producing from 30 to 35 per cent. of the milling supply, but on account of the great area of face over which the ore was exposed. A vast chamber had been opened up and high-grade rock appeared upon every side. Within a comparatively short distance beyond this point, along the course of the pipe, the tin began to disappear, until it finally became practically exhausted. The great chamber of ore seemed to have no extension in any direction, and the only conclusion that could be arrived at was that the mineralising agencies which were responsible for the creating of this particular body had spent themselves in one colossal effort and that the limit of payable rock had been reached in this section. Further driving along the supposed course of the pipe tended to confirm this view, but exploratory work was continued, nevertheless, more in an adventurous spirit, perhaps, than with the hope of finding anything of value. In a mine such as that of Zaaiplaats, the finding of an ore body unexpectedly at any point is a condition that has been demonstrated by experience, so that the carrying on of the drive was not without some justification. After some distance, however, tin began to re-appear, and with this encouragement work was vigorously maintained. The ore widened out and became richer, until once more there were unmistakeable signs that the true extension of the No. XIII pipe, with its accustomed features, had been again located. Since then development has been extended in excellent ore, and when the values gave evidence of being continued downwards as well as laterally, a winze of somewhat ample dimensions was sunk for the purpose of following them down. At about 30 feet below the drive a level was driven each way along the plane followed by the pipe, and at the time of our commissioner's recent visit had been taken for a distance of 85 feet in one direction and 32 feet in the other, beyond the winze opening. High values and solid ore were being disclosed in the faces at each end. Some 40 feet lower another drive was being commenced, and here rich ore was being disclosed in the north-western end. In the south-eastern face the actual direction of the ore body had not been ascertained, and shots were being put in for the purpose of coming to a decision upon this point. The accompanying diagrams will serve to explain the position of things at the date referred to. The elevation shows the exploratory work

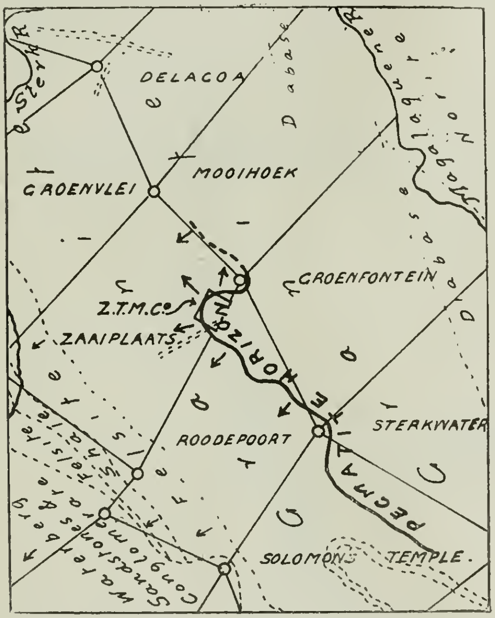


Sketch showing Position of Drives and Ore Body at Bottom of No. XIII. Section.

upon what may be called the plane of the pipe, that is to say along the plane of the fissure which appears to have influenced the course followed by that ore body. The section through the main winze, and across the plane of the fissure, shows the steep dip of the plane at this point, and illustrates the great enlargement of ore that has taken place at the intersection of the main fissure and a secondary one which lies at a much lower angle, nearly horizontal, in fact.

The Fissure Plane Theory.

The effects shown in our diagrams tend to confirm a theory which has been tentatively held by various observers for some time past, and which has been put forward upon several occasions in the columns of this journal. It is, briefly, that the pipes which constitute, almost exclusively, the ore bodies at Zaaiplaats are the result of a mineralising action which took place along the intersecting lines of various fissure systems, the most prominent of which are those which run in a north-westerly and south-easterly direction, and which seem to have most facilitated the movement of the mineralising vapours. The irregular course of the pipes is to be accounted for by the local and temporary influence of minor fissures. It follows, then, if the theory be a reliable one, that in exploratory work the evidence of fissure planes must be carefully examined, and that no pipe can be said to be finally lost as long as there are fissures unexplored in its vicinity. In making a choice among several, where actual evidence of mineralisation is absent, those running continuously with the original pipe plane, or nearly so, are presumably the most favourable.



Sketch Map, showing abrupt curve in the Pegmatite Horizon on the Zaaiplaats Company's Claims.

A couple of years or so ago, when the management was in the hands of Mr. C. Fred. Thomas, as *locum tenens*, the consulting engineer, Dr. Merensky, came to the conclusion that some of the pipes were terminating in lodes. He based his conclusions upon the tabular form which was being assumed by the ore bodies in some of the workings, and upon the clear evidence that the pipes generally ran in definite parallel planes. Later developments do not confirm this view as far as the lodes are concerned, but they have practically established the opinion with regard to the influence of the fissure planes.

An important deduction to be drawn from this fact is that, as we have already suggested, the more prominent fissures are likely to be the repositories of a much more numerous group of pipes and other ore bodies than have so far been discovered. The pipes, in fact, appear to represent the chimneys and shoots of ordinary lodes in a more concentrated or segregated form. It will take a great many years to explore thoroughly the numerous fissures and cross fissures which undoubtedly intersect the Zaaiplaats claims and any one of these may be marked by the existence of payable ore bodies of considerable extent. At present the exploratory work which is being carried on in the levels at the bottom of No. XIII. is being directed with a view to investigating the fissure plane of the pipe in the lower horizons. Here, as previously, the pipe form is absent, and the tabular form of ore body appears to prevail, and this fact suggests that the pipe form has been assumed nearer the surface of the granite country rock where the pressure was diminished, and that in depth, where movement was not so easy, the mineralising vapours formed masses of a more compact kind. With the data so far available, however, only the most tentative theories can be held with respect to the manner in which the Zaaiplaats ore bodies were originated.

The Unique Richness of Zaaiplaats.

It has been remarked that if those who pegged out the Zaaiplaats claims in the early days could have foreseen the discoveries which were to be made subsequently, they could scarcely have marked off their area with more discrimination or more fortunately than they did. It is a curious fact that the richest and most prolific pipes in the Potgietersrust tin field have been found within the boundaries of the Zaaiplaats Tin Mining Company, Ltd., and that outside them no ore bodies equalling them in value have as yet been opened up, in spite of a fairly rigorous and exhaustive search. No satisfactory reason, indeed none at all that we know of, has been put forward to account for this somewhat unique state of things. It was touched on briefly in the course of several articles upon the tin deposits of the Transvaal, which were published in the *S.A. Mining Journal* a few months ago. The following theory is advanced with all due hesitation and reserve as a possible explanation of the facts mentioned and with the hope that it may lead to other expressions of opinion upon the subject.

Taking it as understood that the tendency of mineralising vapours is to ascend towards the higher parts of the magma in which they arise, and to form ore bodies in the uppermost portions of those rocks through which they are able to move, as has been explained by leading geological authorities, it follows that the richness and concentration of these ore bodies are largely dependent upon the extent to which the mineralising agents have been constrained to take certain directions to the exclusion of others. An examination of the geological structure and contour of the granite rocks in the neighbourhood of Zaaiplaats leads to the opinion that we have there just such conditions as would be likely to influence a more intense flow of the mineralising vapours than elsewhere. The accompanying sketch map, taken from the Memoir of Messrs. Kynaston and Mellor, upon the geology of the tin fields, will serve to explain this. The horizon of pegmatite, which marks the upper limit of the ore bodies in that neighbourhood, is marked by a thick line. The overlying fine-grained granite, already cooled and resistant, formed a sort of hanging wall along which the vapours rose through the subjacent uncooled granite towards the edge of the laccolith. A distinct and somewhat sharp fold in the granite horizons occurs near the common boundary of the farms Zaaiplaats, Mooihoek, Roodepoort and Groenfontein, and assuming that it was in existence previous to the intrusion of the tin-bearing granite, it follows that it would influence the direction and manner of flow of this rock and its contained gases and vapours. The dip of the granite around the curve makes it clear that the latter widens downwards, and that its walls would take the shape of one-half of a cne with a wide base and comparatively narrow apex. All the ore-forming vapours that arose for a long distance around the boundaries of the Zaaiplaats claims, which are situated upon the apex of the half cone, would thus be induced to ascend and become more and more concentrated as they approached the common point in the upper parts of the tin-bearing granite. Upon this theory the characteristics of Zaaiplaats seem to be susceptible of easy explanation, unless there be some flaw in the argument which is not apparent to us. However this may be, the peculiar richness of the pipes, [illegible] persistence in one shape or another as compared with [illegible] in the neighbourhood are facts which cannot be overlooked, and since a careful investigation of all the available evidence should lead to the understanding of these phenomena, it seems desirable, in the interests of science, no less than of the Zaaiplaats Company, that the question should be more extensively considered.

THE MODDERFONTEIN GOVERNMENT AREAS.

Initial Considerations in the Milling Scheme—Battery to be Located at the South-East Shaft—An Immense Tonnage of Ore Awaiting Development.

Although there has not been sufficient time since the Board decided to proceed forthwith on preparations for the erection of a reduction plant on the property of the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., in which to prepare designs, the engineering department of the controlling House—the Johannesburg Consolidated Investment Company—has already formulated initial plans for the installation of milling and treatment plants. As was stated in our last issue the Modderfontein Areas' mill will in the first place have a capacity of 50,000 tons per month and it is expected that a plant will be operating on this basis of crushing before the end of next year. Having regard to the enormous mining area controlled by the company, the equipment will naturally be laid out with a view to expansion. The second stage in the milling scheme will be attained when plant of 100,000 tons per month capacity is installed, but beyond this there will be further extension, to what limit it is impossible at this early stage in the history of the company to say. Everything, however, indicates that in a few years' time the Government Areas property on Modderfontein will be capable of supplying a much larger equipment than that tentatively agreed on as the second stage in the milling scheme, and of keeping such an installation at work for a considerable number of years.

The Extension Consideration.

Extension to a very considerable degree—if not indeed almost indefinite extension—has then to be borne in mind by the engineering department of the House of Barnato as a primary consideration in connection with the planning of any milling projects for the Modderfontein State Mines. Were it not for this, it is probable that the new Modderfontein Areas installation would be almost a duplicate of the new battery and treatment plant installed on the Consolidated Langlaagte, and the equipment of the Van Ryn Deep, which is now practically completed and is due to commence crushing operations in the course of a few weeks' time. These plants may be regarded as representative of the last word in mill and cyanide plant construction on the Main Reef series. The former obtained an extraction of 96·6 per cent. in March last, whilst the high stamp duty of 20 tons per diem is being obtained, and everything points to the Van Ryn Deep's installation recording equally efficient work. The Consolidated Langlaagte's mill consists of 100 stamps and 10 tube mills, and the Van Ryn Deep's of 80 stamps and 8 tube mills. The essential point of difference between these two equipments is that the Consolidated Langlaagte's slimes plant is of the old decantation type, whereas that at the Further East Rand subsidiary is of Butters' filter design.

A Back to Back Mill.

The Modderfontein Government Areas installation is likely to be similar in design to that erected at the Van Ryn Deep, but the stamp battery will differ in one important particular from both the Consolidated Langlaagte and Van Deep mills in that it will be a back to back equipment, whereas the stamps at Langlaagte and the Van Ryn Deep are arranged on the single row principle. There will thus, too, be a different arrangement for delivery of mill pulp to the tube mills. A battery of back to back pattern naturally adapts itself to extension more readily than a single cam shaft equipment, and this, as already stated, has had to be a dominant consideration in regard to the Modderfontein property. It has been decided to erect the plant close to the south-east shaft—that is, the shaft in which such a highly encouraging reef strike was made the other day. The temporary offices and workshops are located here and the situation generally accommodates itself to concentration of work around this point. The shafts will all be connected up by railway lines and locomotives will transport ore to the mill. This south-east shaft is being deepened and a station cut there, and in a very short time development from this point will be expedited with all due despatch. In the course of a month or two the remaining shaft, the south-west, will reach the reef and with exploitation work proceeding from these four points there should be a very large tonnage of payable ore available for stoping by the time the reduction and cyanide plants are completed.

Dip and Tonnage.

It is impossible at this juncture to venture anything approaching reliable predictions as to the average grade of ore likely to be milled by the company. In this as in every other mine poor zones as well as rich sections are only to be expected, but with an average "payable" recovery throughout the greater part of the mine and a certain amount of rich ore such as was intersected at the south-east shaft to "sweeten up" this average, the Government Gold Mining Areas should secure quite satisfactory profits. The south-west shaft, it may be remarked, is expected to provide a means of attack for a very valuable stretch of ore. As to the size of the property, we may be pardoned if we reiterate what we stated last week. Not only in so far as its partial State ownership aspect is concerned but on account of its size as well, the property is a noteworthy one and bids fair to make history in Rand gold mining. The company has the lease as from November, 1909, of the exclusive right to mine precious metals upon certain two mining portions of the farm Modderfontein No. 167, and the extent of the area is 2,633 claims. The extent of the mineralised area of the property may be the better realised when it is stated that the distance around its boundaries amounts to no less than ten miles. In the northern shafts the average dip of the reefs indicated by work done to date is in the neighbourhood of 14 degrees. In the south-east shaft the reef lies much flatter and it appears likely that there is a considerable flattening tendency. More work will, of course, have to be done before the average dip throughout the mine can be even approximately determined. It may here, however, be stated that at an average dip of 11 degrees the 2,633 claims on a basis of not more than three feet of reef would after a 10 per cent. reduction for faults and broken ground represent nearly forty million tons of ore.

MINING IN THE BARBERTON DISTRICT.

A Field of Increasing Importance—The T.C.L. and Gold Fields Interests.

Interest in the Barberton mining district appears to be increasing rather than decreasing, and it is of very considerable importance to learn that the larger mining houses are now taking a leading part in the exploitation of this once highly prosperous gold mining field. The Transvaal Consolidated Land and Exploration Company has held large interests in the area for some considerable time past, whilst during the current year this important offshoot of the Central Mining and Investment Corporation has acquired further large blocks. Evidences of a desire on the part of the Transvaal Land and Exploration Company to possess more ground in the Barberton or De Kaap mining fields were noticeable at the beginning of this year when the company's agents are stated to have pegged something like 2,000 claims in the direction of the Zwartkopjes and Fairview mines. Ground extending from the Zwartkopjes in the direction of the French Bobs mine, and from Fairview down the river to the Caledonian was also taken up. Just recently the company, so it is understood, has pegged further extensive areas and has taken up large blocks of ground.

Government and Chamber of Mines Returns.

Mining activity in the Barberton district cannot be properly appreciated from the monthly analysis of gold production in the Transvaal as issued by the Chamber of Mines, since there are numerous small producers in the Barberton district which are not members of the Chamber, but which nevertheless are prospering concerns. The figures issued each month by the Union Department of Mines deal, however, with all properties in the several mining districts. This view of the matter may be more clearly defined by contrasting the statistics of the Chamber and those of the Government Department. Take, for example, the figures published in respect of March operations. The Chamber's figures for the Barberton district are as under:—

Company.	Stamps.	Tube Mills.	Tons. Milled.	Output
Barrett	—	—	2,440	£556
Sheba	60	—	6,220	12,811
Worcester Exploration ...	40	2	6,000	5,004
	100	2	14,660	£18,371

The Government figures are:—

No of Mines Dropping Stamps.	Stamps at Work.	Tube Mills at Work.	Tons Milled.	Total Output for Mining.
11	192	2	20,076* 915†	£27,689

* By stamps and tube mills.
† By other appliances.

Subtracting the Chamber's figures from those published by the Mines Department, it is evident that in the Barberton area there were during March eight mines milling and declaring gold which do not enter into the Chamber's statistics. These miniature propositions had 92 stamps and one tube mill at work, milled 6,331 tons of ore, and recovered gold worth £9,318. In addition, there was one mine with 20 stamps at work which did not declare any gold for the month; whilst six reef diggers declared 277 fine ozs. It is thus obvious that Barberton as a small man's mining field is of very considerable importance to this country, and were these Barberton propositions situated in the Hartley or some other fashionable small mine district of Southern Rhodesia much more would doubtless be heard of them. As it is, numerous small owners have for a long time past been quietly earning profits from properties which, although not sufficiently large or valuable for operations on a large scale by a limited liability company, are capable of giving good returns to small syndicates in which the owners are working partners.

Interests of Large Corporations.

From this remark it must not be inferred that Barberton mines are not worthy of the consideration of companies operated on a limited liability basis. The facts that the Transvaal Consolidated Land and Exploration Company is extending its sphere of influence in the Barberton area and that the Consolidated Gold Fields Company is also reported to be paying a certain amount of consideration to the Barberton district establishes the value of the De Kaap area to large companies as well as small ones. Many of the auriferous lodes or reefs in the Barberton district are of refractory nature and for this reason results secured by numerous mines have been very disappointing. Under the auspices of powerful corporations possessed of laboratories and skilled metallurgists methods will no doubt be devised which will solve the troublesome treatment problems of the past. In a recent issue we referred to a new electrolytic method which has been invented locally and which is stated to have secured high extractions from refractory Barberton ores. A leading House is, we understand, lending this metallurgical syndicate encouragement, and if the results secured in the laboratory can be duplicated in actual practice on the mine the new method should greatly simplify the problems which some Barberton mines have to face. As to the Consolidated Gold Fields Company, it is of much interest to learn that in addition to the work being carried out in the Clutha Mine under the auspices of that corporation the Gold Fields people are prospecting a long stretch of ground below the Clutha, including Mick's Luck and the adjoining blocks. Altogether it looks as if mining in the Barberton district is gaining in importance. The greatly improved prospects of the Sheba, the good results secured by the smaller mines, and the identification of two leading London-Johannesburg mining Houses with the district should all assist in giving to the Barberton fields something approaching the measure of importance they assumed some years ago.

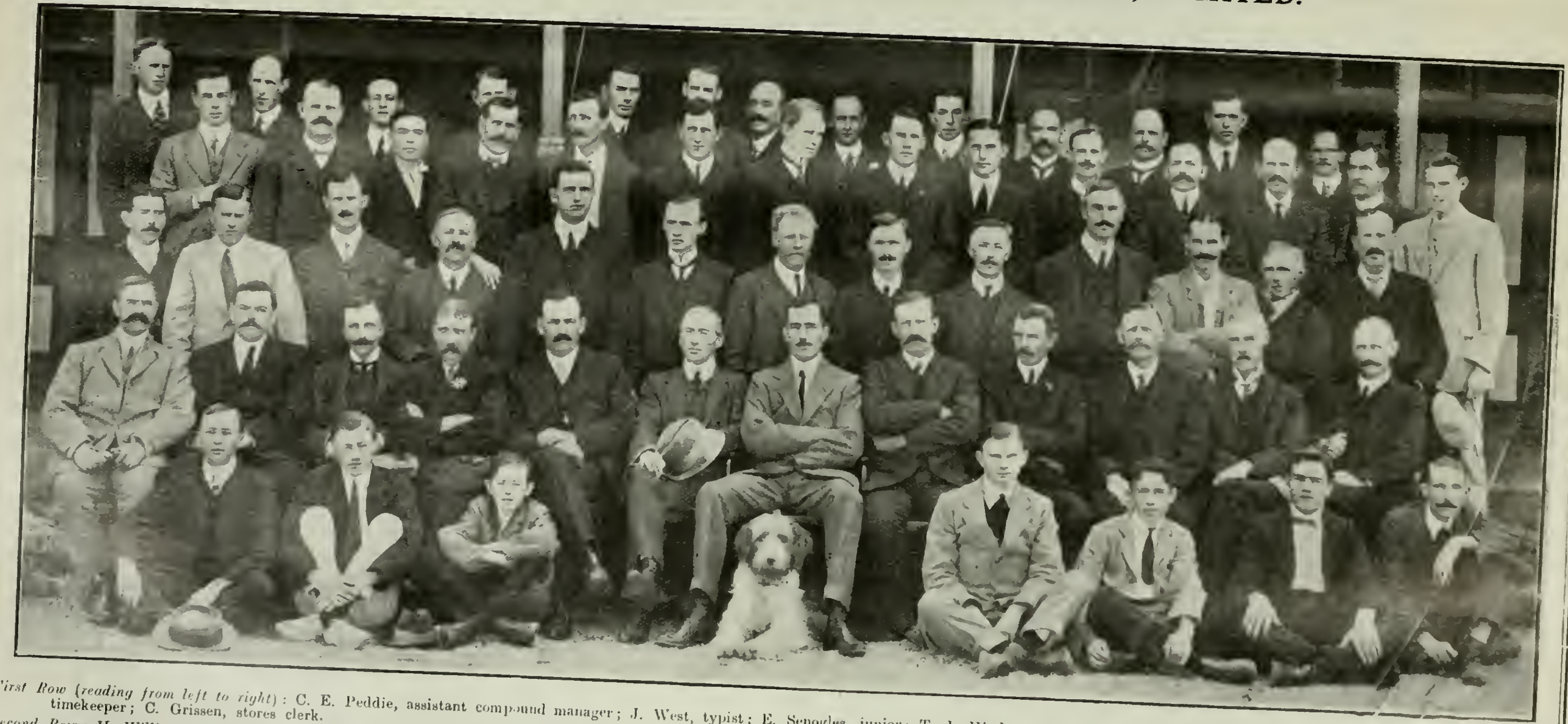
RAND COLLIERIES AWAITING RECONSTRUCTION.

Reef Values—Ore Reserves 374,200 Tons at 5.375 dwts.

Speaking of fluctuating reef values at the Rand Collieries meeting, Mr. George Nathan, who presided, remarked:—

It was not until the early part of February of the current year that the reef was intersected in the crosscut at a point 1,052 feet from the east incline. Drives north and south, and a winze east, were at once commenced. The reef where first encountered by the crosscut was so small as to be only a contact; the subsequent development in both north and south drives and in the winze indicates that the ore body is of a lenticular character, varying in width from a few inches up to two feet. The values also fluctuate in an extraordinary fashion, some sections sampled assaying below 1 dwt., while others have given values as high as 26 dwts. calculated over a stoping width of 36 inches. Generally speaking, the values are either hopelessly unpayable or, alternatively, very distinctly above the pay limit; but, taking the distances as a whole, the average value of the drives and winze so far opened up is low. The south drive was stopped in dyke last month, but the north drive and the winze are still being continued, with the object of gaining further information as to the nature and values of the reef. In view of the foregoing remarks, you will gather that no further accession has been made during the past year to the ore reserves, which therefore remain at the estimated figure of 374,200 milling tons, fully developed, of an average value of 5.375 dwts. over an assumed stoping width of 42 inches. The General Mining and Finance Corporation, Ltd., has continued to advance the necessary funds for the prosecution of development operations, and your company's liability in this respect amounted to £145,117 at the close of the past year.

THE STAFF OF THE NEW KLEINFONTEIN COMPANY, LIMITED.



First Row (reading from left to right): C. E. Peddie, assistant compound manager; J. West, typist; E. Senogles, junior; T. J. Hind, compound clerk; L. Evens, junior; H. Molam, assistant native timekeeper; C. Grissen, stores clerk.

Second Row: H. Williams, foreman timberman; W. R. Rowe, underground engineer; F. Eckler, mine captain; J. Polgrean, mine captain; W. W. Morrish, mine captain; H. L. Krause, former underground manager; R. M. Torin, former manager; A. Munro, engineer; G. A. Watt, resident secretary; S. Russell, battery manager; J. Hogg, cyanide manager; J. K. Erskine, metallurgist

Third Row: C. Crichton, assayer; C. Roy, shiftboss; A. Duncan, cyanide foreman; C. E. Medhurst, shiftboss; R. J. Dean, shiftboss; R. R. Came, shiftboss; G. Marshall, construction engineer; R. C. Evans, head sampler; R. Surtees, surveyor; C. S. Ramsbottom, storekeeper; E. Malden, assistant storekeeper; W. Joss, workshops foreman; W. H. Harris, native timekeeper.

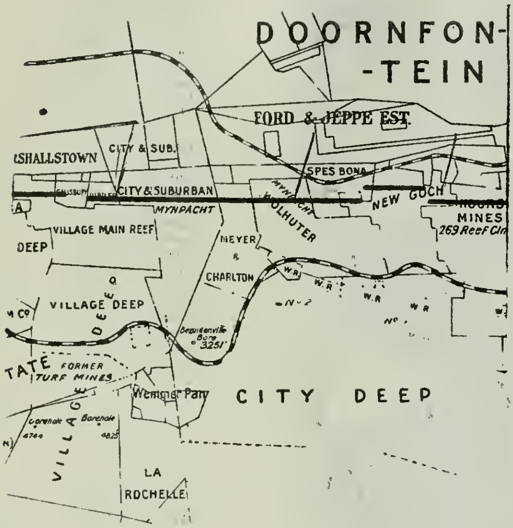
Fourth Row: J. S. Fraser, sampler; M. J. Wright, shiftboss; W. Gaven, assistant assayer; L. Williams, shiftboss; A. Walker, shiftboss; W. J. Watson, shiftboss; F. Zabel, shiftboss; J. E. Metcalf, assistant assayer; J. K. Gilliland, European timekeeper; G. F. Gaydon, cashier; C. W. Bryson, foreman carpenter; A. P. Volum, foreman fitter; A. Stuart, crusher house foreman; L. Green, assistant surveyor.

Fifth Row: R. F. Robinson, shiftboss; J. P. Horne, foreman electrician; — Le Jeune, assistant surveyor; F. Jenkins, battery foreman; J. Brennan, assistant native timekeeper; F. S. Stirton, assistant native timekeeper; R. H. Kent, compound manager; F. O'Flaherty, mine captain's clerk; S. J. Taylor, clerk; J. W. Aiken, assistant native timekeeper; J. Clark, foreman smith; D. M. Mackay, stores clerk; W. R. Prince, clerk.

CITY DEEP AND CITY AND SUBURBAN.

Transfer of Claims—Reasons for the Step—Full Terms of the Agreement.

Reference to a map of the Central Rand will show that the claim areas of one or two companies are of almost triangular dimensions and their shape seems to suggest that difficulties may be experienced in strictly confining mining operations to the area of the company concerned during the process of exhausting the claims. One proposition of such awkward shape is the City and Suburban G.M. Co., and this fact no doubt in large measure influenced the City and Suburban Company to enter into the provisional agreement with the City Deep, Ltd., whereby the City and Suburban Co. will acquire from the City Deep, Ltd., a certain portion of that comany's mining area, equal to 15 claims adjoining the more southerly part of the south-eastern boundary of the City and Suburban Company's property and "consisting of a defined area of 10 claims and an additional area of 5 claims, the exact boundaries of which latter area are to be finally located hereafter in the manner described in the agreement." The price of the claims is fixed at £101,250, or £6,750 per claim, and the City and Suburban Company, upon determination of the boundaries of the 15 claims, is to have the right for one month to acquire an additional area equal to 2·7 claims, being an extension of the 15 claim area at the same price, *i.e.*, £6,750 per claim. The purchase price is payable as to £25,000 one week after ratification of the agreement by shareholders of both companies in general meeting, and as to the balance, in four equal annual instalments with interest at 5 per cent. per annum with liberty to the purchaser to pay off the whole or any portion at any earlier time. The purchaser will have the right to take possession and commence work on paying the £25,000, being liable for all rates, taxes and licences. Transfer will be given of the ten-claim area when payment of £67,500 and all interest due has been made and the diagram thereof has been confirmed, and of the remaining areas equal to five claims, upon payment of the balance of the purchase price and all interest and on final determination of the areas and on confirmation of the diagrams thereof. The agreement is, of course, conditional upon its confirmation by resolution of the shareholders in general meeting of each company. We attach hereunder a map of a section of the Central Rand which will enable one to appreciate the value of the exchange to the City and Suburban Company. It may be remarked that the claims in question are in close vicinity to where the Bezuidenville borehole cut the reef at a depth of 3,251 feet. To the City Deep the scheme of transfer will be decidedly advantageous, inasmuch as it will enable the City Deep Company to sink the new circular ventilation shaft without interfering with the dividend payments of the company.



Mr. Schumacher made an interesting reference to the matter at the City Deep meeting on Thursday. He remarked of that company's financial position:—

> The finances will be further strengthened by the proceeds of the 15, or possibly 17, claims situated at our western boundary, which we propose to sell to the City and Suburban G.M. and Estate Company, Ltd., at £6,750 per claim, as explained to shareholders in the circular issued to them yesterday. This matter will come up for consideration at a special meeting to be held on August 5, 1913. The sale was provisionally agreed to by your directors, because we can spare the claims from our great holding, because they can be more easily worked by the City and Suburban G.M. Co., because we consider the price to be satisfactory, and because we want the money. Assuming this deal to go through, as we believe it will, because it is attractive to both mining companies concerned, we shall have strengthened our cash resources so as to balance the total liabilities on capital account which face us as from the 30th of this month, provided a dividend of 2s., as we expect, is declared at that date. We shall then have on the one hand surplus net cash amounting to approximately £43,000, apart from the money that will accrue to us from the sale of the 15 or 17 claims, which will amount to £101,000, or possibly £115.000 (without reckoning interest), the greater portion of which will be received within two years from next August. . . . . . You will gather from what I have said that the capital expenditure which we must incur, and which is spread over a considerable period of time, will not appreciably affect the declaration of dividends, provided the proposed sale of claims to the City and Suburban G.M. Co. is ratified by the shareholders of both companies; in other words, the working profits that we shall earn will, in the main, be available for distribution to shareholders, apart from such sums as it may be considered advisable to put on one side, in order to make the financial position of the company strong.

List of Authorised Explosives.

The Minister of Mines has cancelled Government Notice No. 1987, dated 30th November, 1911, and declared the under-mentioned explosives to be authorised explosives within the meaning of section two of the Explosives Act, 1911:—I.—Manufactured in South Africa: (a) Nitro-compounds (containing nitro-glycerine), blasting gelatine, antifume gelatine (Nos. 1, 2, and 3), E.O. gelatine (Nos. 1 and 2), Lion gelatine (Nos. 1 and 2), velox gelatine, reef gelatine, gelatine dynamite (Nos. 1 and 2), gelignite, dynamite No. 1 (Guhr.), dynamites II, IIA, IIB, IIC, IID, and IIE, and III, premier dynamite, I and II, Rand dynamite, union dynamite, coal dynamite, farmers' dynamite, A and B, dynamites, 20 per cent., 30 per cent., 40 per cent., and 50 per cent., ligdyn dynamite, 1, 2, 3, and F, coal powders, Nos. 1, 2, and 3, union ligdyn, 10 per cent.-20 per cent., arkite. (b) Nitro-compounds (not containing nitro-glycerine), nitro-cotton, lighting torches or tshisa sticks (these are also manufactured under the heading of nitrate mixtures and chlorate mixtures). II.—Imported from oversea: Any explosive, provided that it is included in and conforms to the "authorised list" of explosives in force in Great Britain, such as:—Gunpowder, blasting and sporting powders, safety fuse, ammunition of various kinds (cartridges), detonators and percussion caps, nitro-cotton, fireworks of various kinds, tshisa sticks, blasting cartridges of various kinds. And further, provided that it arrives in good order and is packed and imported in accordance with the regulations framed under the Explosives Act, 1911.

THE OUTLOOK FOR THE CINDERELLA CONSOLIDATED.

A Disappointing Year—Future Development Plans.

"DISAPPOINTMENT" was the keynote of Mr. George Nathan's address at the annual meeting of the Cinderella Consolidated Company last week end. The trials and tribulations of this concern have from time to time been fully recorded in the columns of this journal, and we pass on from Mr. Nathan's remarks anent labour shortage and reverse faulting to his statement of the latest position underground and the future plans for development.

The central shaft, remarked Mr. Nathan, has now reached a vertical depth of approximately 2,800 feet, thus leaving a distance of some six hundred feet still to be sunk before intersecting the reef. At the incline shaft in the Cinderella Deep section, the 5th level station haa been completed. The 5th level connection drive, which, aa already stated, has attained a total length of three thousand feet, will have to be driven a further 2,000 feet east in order to reach the point at which the projected incline shaft from the central shaft will be aunk; the excellent values met with in this drive up to the end of the past year are referred to in the manager's report attached to the accounts, and I now supplement them by giving you the details of the footage driven for the four completed months of this year:—

	Footage driven or sunk.	Footage sampled.	Value. dwts.	Over.
5th level east (connection drive) ...	401	155	5.7	42
5th levet east (No. 1 winze)	304	285	6.2	42
5th level east (overlap)	196	180	9.5	42

In explanation of the large difference between the distance driven and the footage sampled in the connection drive, as reflected in the above figures, I may say that the drive was either in dyke or in country rock for the greater part of the last four hundred feet. In regard to the south section reef, the levels being driven continue to exhibit the same characteristics as heretofore, that is, fair stretches of payable ore, alternating with other stretches of low value.

FUTURE DEVELOPMENT.

Passing on to the all-important question of the future development of the property, the objects which we have in view are, shortly, as follows:—Taking first the Cinderella Deep section, the 6th level (north section reef) will be intersected by a crosscut from the corresponding level of the south section reef some time in August, and driving east parallel to the 5th level connection drive will be commenced. About the same time, sinking in the incline shaft to the horizon of the 7th level of the south section reef will be taken in hand, and it is expected that the drives on the latter level will be started up in March next. As regards the ground leased from the Government in the northern portion of this (Cinderella Deep) section, which is for the most part at present intact, this will be opened up by two levels on the south section reef between the 3,620 feet level and the 3,000 feet level, and in the ordinary course should be practically developed by the end of next year. As this undeveloped area is approximately 2,500 feet in length on strike, and 600 feet on incline, it represents a very considerable tonnage of reef. The north section reef in the same ground will also be developed between the 3,450 and the 3,000 feet levels, but the completion of this work will probably be at a later period. With reference to the central portion of your property, the vertical central shaft will be sunk to the reef, and subsequently an incline shaft, to be carried below the reef, will be started up, for the purpose of meeting a wide raise to be put up from the 5th level connection drive now coming from the Cinderella Deep section, and previously described in my remarks. It is estimated that altogether about 1,600 feet of sinking and raising will be necessary in this incline shaft. As the sinking of the incline proceeds, levels will be laid off east and west for the purpose of developing the ground in the vicinity, but it is not proposed to do this in the inatance of that portion which will be rising from the connection drive until the connection has actually been effected and the requisite subsequent stripping of the shaft completed. From the foregoing remarks it will be seen that during the time which must elapse before the connection is eatablished between the two vertical shafts a very large amount of development work on reef is contemplated, which, given fair average values, ahould add very materially indeed to the ore reserves, and render practicable, from the mining point of view, a considerable increase in the crushing capacity of the reduction works. With Mr. Nathan's remarks on the closing down question we deal in our leading columns.

POSITION AT THE NEW GOCH.

Better Developments—Treatment of Old Slimes.—Results "Short of Anticipations."

AFTER reviewing the results secured at the New Goch mine last year, the Chairman, Mr. George Nathan, remarked at the annual meeting held the other day:—

As regards the results obtained from gold production for the first four months of the current year, these reflect an improvement on the figures for the corresponding period of last year, but still fall short of our anticipations. In reference to development operations, I give you details of the footage driven and sampled and the values exposed in the lower levels of the mine during the period from January 1 to April 30 of this year:—

	Driven. feet.	Sampled. feet.	Value. dwts.	Width. inches.
Main Reef—				
14th level, west drive ..	110	60	5·9	77
15th level, east drive ...	39	30	7·5	56
16th level, east drive ...	191	190	6·6	80
16th level, west drive ...	192	185	4·2	71
17th level, east drive ...	165	145	6·5	68
17th level, west drive ...	190	150	4·3	69
(In faulted ground)				
10th level, east drive ...	74	85	6·7	86
10th level, west drive ...	9			

A summary of the whole of the foregoing figures gives an average value of 5·8 dwts. over a stoping width of 72 inches for the 845 feet sampled, or approximately three-fourths of a dwt. above the average value of the ore reserves at December 31 last. An encouraging feature in connection with this development is that in the instance of the lowest (*i.e.*, 16th and 17th) levels the values have been steadily improving in both east and west sections as the drives get further away from the shaft; in the course of the next two or three months a large proportion of this ground will be available for stoping. As regards future development work, arrangements have now been completed for facilitating more rapid sinking in the main incline shaft, and it is expected that the 18th level will be reached by July next. There will shortly be an accession to existing sources of revenue in the shape of gold recovered from accumulated slimes; there are approximately 200,000 tons of these, as ascertained by survey and boreholes, of an average assay value of 2 dwts. per ton. It is estimated by your manager that the recovery value will be 6s. 4d. per ton, and the cost of treatment 3s., with a resultant profit of 3s. 4d. per ton, which, on the basis of treating 3,000 tons per month, will yield an additional monthly profit of approximately £500 for a period of about 5½ years. The foundations for the small additional treatment plant have already been completed, and the plant itself should be erected and ready to commence operation in August next.

Ermelo Coal.

The Ermelo Townships Colliery, Ltd., is a new venture formed to deal with a coal deposit on the Ermelo town lands. The directors are Messrs. H. J. Miller (chairman), Ernest Lezard and Fred C. D. Cohen (joint managing directors), Jas. Seligman and J. H. Paul. The property has been reported upon by Mr. W. J. Hallimond, M.I.M.M., M.I.M.E., who calculates that the 3,600 acres secured by the company will yield 18 million tons of coal of excellent quality, or, in other words, 240,000 tons per year for 75 years. He points out in his report that the seam—about 5ft. 3in. on the average—has been proved by bores to be good all over the property, and that it is of a high calorific value. It is right on the railway line, and is 312 miles from Delagoa Bay and 171 miles from Johannesburg—thus admirably adapted for supplying large orders and for an export trade.

Roberts Victor.

The following was the result of the working of the Roberts Victor mine for the month of May, 1913:—From the 19th May, when washing was resumed, to the 31st May, 7,935 loads were washed. Total recoveries for month, 2,965¼ carats.

RECENT DEVELOPMENT AT THE VILLAGE DEEP.

Values in the Deeper Levels—Profits to Date.

Mr. H. C. Boyd presided at the annual meeting of the Village Deep this week, and having reviewed the balance sheet and reports for 1912, gave some interesting particulars regarding the present position of the mine. Dealing with the recent development work, Mr. Boyd said:—

Advantage has been taken this year of the satisfactory labour position to push development generally, and 9,270 feet of development have been accomplished up to the end of last month. This has had the effect of further increasing the amount of blocked out ore in reserve. We are continuing to charge 3s. 6d. per ton for development, and this should be borne in mind in considering the question of our working costs. The Main Reef Leader is continuing to open out satisfactorily; all the ore valued this year has been payable, but so far the average is, if anything, slightly lower than that of the ore valued last year.

SOUTH REEF DEVELOPMENT.

On the South Reef, as already mentioned, there have been further encouraging results. Till comparatively recently, payable values in this reef had virtually only been found on the west side of No. 2 incline, and, in the lower levels, comparatively near to the shaft. Payable values are being disclosed continually farther west, and have now been encountered on the other side of the shaft on the 13th level, where about 200 feet have been driven on payable reef, while encouraging values have just been struck in a crosscut from the Main Reef Leader on the 14th level. Work was discontinued for the time being on the South Reef referred to at the last annual meeting as having been encountered on the 10th and 11th levels in the centre of the property, as the values were unsatisfactory.

TURF SECTION VALUES.

In the Turf section, values generally are being well maintained, and it is important to note that this equally applies to the very bottom of the mine. On the 19th level, 68 feet have been sampled, out of 150 feet driven at the end of April, and on the 20th level driving has just begun; the Main Reef Leader disclosed on these two levels is fully up to the average of the ore reserves. No. 3 incline shaft is now about 80 feet below the 20th level station.

CURRENT YEAR.

The total working profit for the first four months of the year was £95.684, and it is expected that the profit for last month will prove to be appreciably above the average of these preceding months. The only capital expenditure commitment entered into this year has been the ordering of a large hoist for No. 3 incline, costing £17,000. This amount was included in the capital expenditure position as stated in the last quarterly report; at the end of April £36,000 in all remained to be spent on capital account, practically all in connection with the extension of our hauling arrangements. As operations become more centralised at No. 3 shaft, it will probably be necessary to extend some of the buildings there; otherwise no further capital expenditure can be foreseen at present.

Though it is not possible to give exact figures at this stage, it may be said that this company will gradually receive about £18,000 if the Bill now before Parliament, for the disposal of the amounts accruing from the bewaarplaatsen leases, becomes law. It will be apparent that the position of our mine is quite satisfactory, and that we may look forward with confidence to the maintenance of recent profits, unless the labour position alters materially for the worse.

FUTURE OF THE WEST RAND CONSOLIDATED.

Improved Prospects—An Ambitious Development Scheme.

At the annual meeting of the West Rand Consolidated Mines Mr. Nathan, who presided, gave some interesting particulars as to the future development and equipment policy of that company. He said, *inter alia*:—

Now as to the large development scheme which we have initiated, and which, by reason of the improved native labour position on the mine, is at the present time being actively prosecuted. Taking the respective sections of the proper seriatim, the east vertical shaft, which, as its name implies, serves the eastern section of the mine, has been sunk since the beginning of the year a further distance of 222 feet to a total depth of 2,218 feet, or 426 feet below the twelfth level, and the excavation of the station at the projected fourteenth level has already commenced. The west shaft (of seven compartments), which deals with the deep levels of the western section, had been sunk to a depth of 1,547 feet at the end of last month, equivalent to 194 feet beyond the eighth level, and it is expected that the cutting of the tenth level station will be in progress in June; the permanent electric pump station at the sixth level was completed and in operation in February. The eighth level will not be continued westwards, owing to the faulted character of the ground in that direction, but the sixth level crosscut, which is only a short distance above, will be driven beyond the point of intersection with the winze from the third level, until it encounters the reef, after which it will be carried on reef to the western boundary. The new tenth level will be driven at first on reef, then as a crosscut through the unsettled ground, and afterwards on reef again also to the western boundary. So that there will be no levels between the third and the sixth, and between the sixth and the tenth, both of which will have backs of about 900 feet, and, given reasonably unbroken country, should open up approximately 400,000 tons of ore in each instance.

NEW PROJECTS.

The foregoing remarks deal with the projected development of the Main Reef series. The Battery Reef will be developed, as hitherto, mainly by means of the Rand shaft, but, in addition, in order to expedite the opening up of the ground, the Flora shaft, which is situated some 2,800 feet to the north, has been dewatered to below the third level, and as soon as further dewatering operations will permit (in all probability in June), sinking will be recommenced in this shaft also. At the same time the second and third levels south, which were driven on many years ago for a distance of 1,160 feet and 700 feet respectively, will be extended to meet the corresponding levels now being driven north from the Rand shaft. As regards the southern section of the Battery Reef, this has already been intersected in the Rand "A" development shaft (about 2,350 feet to the south of the Rand shaft), which had reached a depth at the end of last month within 60 feet of the horizon of the fourth level; the third level has been commenced, and is being driven north with the view of connecting with the third level south from the Rand shaft. The result of this linking up of the three shafts will therefore be that, without taking into account for the present the ground lying to the south of the Rand "A" shaft and to the north of the Flora shaft, we shall have a length on strike for the 3rd and succeeding levels of round about 5,150 feet, which, provided that recent development values are maintained, will enable us to open up very large tonnages of payable ore under comparatively favourable mining conditions, and therefore at a moderate cost. The Rand shaft has been sunk to a total depth of 1,536 feet on incline, and the resumption of sinking (which was suspended in the latter part of last year) will be taken in hand after the completion of the pump station and the installation of the electric pumping plant at the 6th level, which should be effected by the end of August. I may perhaps add that driving is in progress at each face of the 2nd, 3rd, 4th, 5th and 6th levels in this shaft. In the foregoing remarks I have endeavoured to give you a general view of the comprehensive development operations which we have laid out, and which are in active progress at the present time. Our object is to reach with as little delay as possible the position at which our ore reserves and the general outlook of the mine will amply justify us in doubling the present capacity of the reduction works to allow of an output of 60,000 tons monthly, and so achieve the second stage of our endeavours as regards this property.

Transvaal Estates and Development Co.

Mr. F. J. Dormer, presiding at the annual meeting of Transvaal Estates and Development Co. in mail week, said that, in view of persistent attempts to represent the company as greedy absentees fattening upon rents they did nothing to deserve, it might be observed that the company had spent on development more than the entire revenue from land. On its investments the company had realised a loss of no more than £2,319 in twenty-five years, notwithstanding the heavy depreciation which had occurred in values generally. The income from this source should now increase. If they sold the whole of their estates at the rate realised for the farms actually disposed of by them, that asset alone would exceed the total capital at par, omitting the mineral rights altogether.

Blaauwbosch Diamonds.

The following are the washing returns for May: 10,156 loads washed, 1,864 carats recovered; equal to 18·35 carats per 100 loads.

DISAPPOINTING YEAR WITH THE ROODEPOORT UNITED.

A Period of Many Difficulties—Future Policy.

In moving the adoption of the report and accounts at the annual meeting of this company, the Chairman said: There is no gainsaying the fact that the operations of the company for the past year have given disappointing results, not only in regard to the ratio of the profit earned on milling, but also in the matter of the decrease shown in the ore reserves as compared with the previous annual report. The yield of 20s. 1d. per ton crushed is the lowest for any year in the history of the mine, and is so much below the average grade of the old Roodepoort United section and of the neighbouring mines in the Roodepoort district that, as remarked in the directors' report for the year, we cannot think that it really represents the average grade of the property as a whole. Whether our opinion is correct or otherwise, however, cannot be determined until a considerable amount of further development in the lower portion of the Kimberley-Roodepoort section shall have been effected, and this again is dependent on the rate of progress at which sinking in the Kimberley Roodepoort Main and Kimberley East shafts can be maintained. In this respect our programme for last year was greatly retarded by the broken formation of the ground met with in both shafts, which rendered it impossible to accomplish normal footages in sinking, and consequently delayed the opening up of new levels which we had hoped to get going. The difficulties attending the maintenance of crushing operations on the ordinary scale, and at the same time developing additional ore vis-a-vis the upkeep of the ore reserves, were increased by other unfavourable factors. For instance, in the case of the upper levels of the Kimberley Roodepoort, the areas lying to the east of the Kimberley Roodepoort shaft and to the west of the Kimberley East shaft are so faulted and broken that little or no ore can be extracted from them. Then again, the Main Reef development on the 11th and 12th levels in the Kimberley Roodepoort, and the 3rd and 4th levels of the Kimberley East sections, disclosed such low values that the drives in question were suspended, and current work concentrated on opening up the South Reef in the Kimberley and in reclamation at the old United section. Furthermore, in illustration of the old adage that misfortunes never come singly, we experienced a fall in the value of many of the stopes under attack, both on South Reef and Main Reef, which, although it may prove to be of a temporary nature, has had an adverse effect on the grade of the ore sent to the mill, and intensified the difficulty of the position in which we were placed by the lack of new faces which would have been available but for the unfortunate and unavoidable delay in development.

AN ENCOURAGING FEATURE

There is one encouraging feature, however, in connection with recent development work, and this is the satisfactory values exposed in the drives east from the lower levels of the Kimberley main shaft, through country which was previously regarded as doubtful, as it lies immediately below the faulted and broken ground met with in the upper levels. I should first explain that to the east of this shaft there is a dyke, approximately 100 feet in thickness and distant about 200 feet from the shaft at the horizon of the 11th level, which is running in a south-westerly direction, and again, some 500 feet from the shaft, at the same horizon, another dyke, the thickness of which has not yet been ascertained, but which is dipping in a south-easterly direction. In other words, the two dykes diverge, so that, as far as can be gauged from present indications, the stretches of unbroken reef between the dykes will increase with each succeeding level.

FUTURE OPERATIONS.

With reference to future operations, naturally the position depends upon the acceleration which may be possible in sinking the two shafts in the Kimberley Roodepoort sections, and the rapidity with which we can open up new levels and extend existing drives—and, finally, the values exposed by this development work. It is obvious that in order to maintain the same level of tonnage crushed as during the past year, there will be a considerable drain on the available stopes, even although this will be for some time to come relieved to some extent by the ore from development faces and other sources. From the foregoing remarks you will gather that the immediate position of the mine from a producing point of view is not satisfactory; on the other hand, it must not be considered as in any way hopeless. By far the larger portion of the Kimberley section is still intact, and the latest development work indicates that we shall meet with more settled country in the lower levels of the mine. Owing in a large measure to the very efficient surface plant which we possess, especially in the instance of the mill and cyanide works, our working costs are well below the average for the district, and if the latest satisfactory development values continue, better profits should be forthcoming. I can only add that if energetic effort will bring about a more prosperous state of affairs, it will not be found lacking.

RECORD PROGRESS AT THE ROSE DEEP.

Increasing Dividends—Success of Amalgamation—Some Facts for Investors.

Mr. R. W. Schumacher presided at the annual meeting of the Modder B. this week and dealt very fully and lucidly with the position and prospects of the company. *Inter alia*, he said:—

Our general development policy is to open up the mine rapidly on the present system of big blocks in order that we may obtain a more thorough knowledge of the property soon, and then, if things are satisfactory, crush on a larger scale than to-day. We have at present a large area of ground developed in the western section of the property, adjoining the New Modderfontein Company, which promises in itself to be a mine of considerable size and unusual richness. The lowest workings in this area, that is, the winzes below the second level, continue to expose ore of high grade, and some winzes are already below the plane of the future third level. Further to the east the third level, coming westwards from the main shaft, has for a long way been in unpayable ground, so it is most desirable that we should push downwards in order to find out more about the value of the reef. It is very satisfactory to note that a winze from this third level, situated almost due south of the main shaft, has latterly shown several decidedly payable assays. To the east of the main shaft the ground is broken, and as we were forced during 1912 by the scarcity of labour to press development in those sections of the mine where we were most certain of opening up payable ore, work was concentrated in the western section of the mine, and the eastern portion had to remain comparatively neglected. Latterly we have again been able to turn our attention to the eastern area, and last month, May, we were fortunate in encountering reef in a prospecting shaft only 236 feet below the surface, and 1,550 feet to the north east of our present most easterly workings. This strike may prove of importance in so far as it helps us to locate the reef much quicker than would otherwise have been possible. The reef here, I must remind you, cannot be followed from the outcrop, as it is overlain by coal formation unconformable with the strata below. It is also known to be considerably faulted and to take a northerly turn towards the Rand-Klipfontein mine. The only other indications that we have of reef values in the large unexplored eastern portion of our mine are the results obtained in the Geduld workings that now almost adjoin our south eastern boundary. The values exposed in these workings have been of very good grade. As far as crushing capacity is concerned, our general policy will be to feel our way slowly, and to increase gradually only as the mine becomes more opened up and development results remain satisfactory. We have, since starting milling operations, kept the cash position of the company strong, and we feel certain that we shall have the approval of shareholders if we continue to do this with the policy of gradual expansion in view. In the near future the contemplated capital expenditure amounts to about £60,000, about the same figure as the cash brought forward at the commencement of the current year. A portion of this sum is required for a new electric hoist, engine room, etc., a further portion for additional married and single quarters, and most of the balance is provisionally set aside to cover the estimated cost of increasing in the near future the crushing capacity of the plant to 40,000 tons monthly. We intend, with your permission, to be free to utilise the funds, so far earmarked for repairs and renewals, in connection with the extension of plant in the future, if thought desirable. I have now tried to make the whole position clear to you. Our property is of great extent, measuring 12,000 feet from east to west. It has been partially opened up with rapidity in spite of shortage of labour. We have already proved a large and rich mine in the western portion of our property; we know comparatively little about the eastern half, which is faulted in places, but there are favourable indications in various localities, each far from the other. The latest developments in the west give us no reason to expect a fall in profits as compared with last year, but you will remember that we have no close control over the output from month to month owing to the large size of the ore blocks and to variations in the value of the stope faces. Fluctuations in the monthly profits may, therefore, continue, and, as I mentioned last year, we shall make no expensive efforts to avoid them; our efforts will be concentrated on working the payable ore, avoiding the unpayable, and keeping broadly to the general average grade of the mine. There is no doubt that the general outlook is very bright, and if we can continue development work without hindrance a very considerable portion of our property may be roughly opened up during the next two or three years. I must add that we expect to declare in a few days a dividend of 20 per cent., or 4s. per share, for the half-year ending the 30th of June. The distribution is a conservative one, and will enable us to strengthen further our already strong cash-position. I can also inform you that we expect a record profit for the past month of May.

THE OUTLOOK FOR MODDER B.

Increasing Profits—Coming Dividend—Recent Development Results.

Mr. H. Eckstein's speech from the chair at the annual meeting of the Rose Deep this week was of unusual interest and importance. Having reviewed the improvement in the finances and working conditions at the mine during last year, he said:—

The improvement in the yield on the 1909 estimates is in my opinion largely due to cheaper mining and careful attention to the efficiency of the reduction plant. If due allowance is made for the unavoidable addition to working costs during the recent years, and if it is understood, on the other hand, that the old Rose Deep and Glen Deep Companies working as individual units could not have had the advantage of the compensating features to which I have just referred, then I say it may be claimed that the amalgamation has been an undoubted success. The policy of extracting ore from old workings in the north section of the Rose Deep, while it is accessible, has been successfully continued. 79,000 tons were obtained from this source last year, and it is hoped that considerable further tonnages will be won before this section has been depleted.

VALUABLE COMPARISONS.

I cannot deny myself the pleasure of putting before you some figures showing the mill tonnages, working costs and the net profit earned by the company during the last three years. They are as follows:—1910: Tonnage milled, 656,500; working costs, 18s. 10d.; net profit, £317,752. 1911: Tonnage milled, 695,100; working costs, 17s. 11d.: net profit, £342,832. 1912: Tonnage milled, 782,200; working costs, 17s. 5d.; net profit, £443,135, inclusive of £25,700 gold reserve. The results during the first four months of the current year compare as follows with those of the corresponding months of 1912: Mill tonnage, 1912, first four months, 253,800; mill tonnage, 1913, first four months, 271,130; working costs, 1912, monthly average for the same period, 17s. 10d. per ton; working costs, 1913, monthly average for the same period, 16s. 9d. per ton; working profit, 1912, for the four months, £134,195: working profit, 1913, for the four months, £150,976. These figures constitute a record of progress of which any company might well be proud. I might go even further and say that they should go a long way towards attracting investors' attention to the possibilities of some of the old-established mines on these fields. During the recent summer months the reduction plants were run to their utmost capacity, the highest tonnage milled in any one month being little short of 70,000. We are advised that it would not be possible to maintain this tonnage during the winter months without seriously raising the slimes residues, as a low temperature always militates against an efficient treatment of the slimes in the time within which a proper treatment is assured in warmer weather. As, given a sufficient supply of labour and a smooth run, the mine is fully capable of supplying the mills at the rate of 70,000 tons per month, the board has recently decided to make a few additions and improvements to the slimes plant at the Rose section, involving an expenditure of about £6,500. It is estimated that this will enable 70,000 tons per month to be put through the mill all the year round, and every effort will be made to reach this figure. The additions should be completed at the end of this month. No further capital expenditure is in sight. Lest it should be feared that in view of the increasing crushing capacity the life of the mine will be shortened, I might state that I hope we have not reached bottom as regards working costs. Any further reductions should allow of our adding to the payable ore reserves certain tonnages of ore which could not have been classed as profitable a year or two ago. The supply of native labour to the mine has, during several months, been almost excessive. I mention this in case you should have misgivings on account of the recent announcement that no further tropical natives will be allowed to be recruited. We had an average of 638 of these boys working last year, and unless, in addition to the probable gradual loss of these boys, there is a serious reduction in the number of our other labour force, I believe that we shall experience little inconvenience in this connection. Gentlemen, I am glad to say that though last year's results have been very satisfactory, indications point to a possible further advance during the current year, and I think that we shall be in a position again to raise our next dividend a little.

EXCELLENT SHOWING OF THE MEYER AND CHARLTON.

A Highly Satisfactory Year—Further Increase in Profits.

At the annual meeting of the Meyer and Charlton Company Mr. Nathan had a highly satisfactory statement to make. He said, *inter alia*:—

I think you will agree that the report of your directors and the accounts for the past year, which have been in your possession for some time, reflect a very satisfactory state of affairs in regard to the position of your company. The gross profit (including sundry revenue) of £200.387 is approximately £63.400 higher than the previous record of £137.000 for the year 1906, and is due to the excellent average recovery value of 42s. 6d. per ton milled during the year, which was only exceeded by one other mining company on these fields, and which is the highest yield in the instance of your mine since 1895.

CURRENT YEAR'S PROFIT.

Regarding the operations of the mine since the close of the past financial year, the previous level of profits has been more than maintained, as the declared working profits for the four completed months to April 30 of the current year have averaged over £20,000 per month. The actual figures are as follows: January, £19,242; February, £20,043; March, £20,562; and April, £20,756. Development work has also continued to disclose highly satisfactory values, especially on Main Reef Leader, as will be seen from the following details of the footage cut from January 1 to April 30 of this year, in the drives and connections under attack:—Main Reef Leader.—18th level, west drive: Driven or sunk, 93 feet; average assay value, 13·6 dwts. over 36 inches. 19th level, east drive: Driven or sunk. 153 feet; average assay value, 17·1 dwts. over 36 inches. 19th level, west drive: Driven or sunk, 160 feet; average assay value, 34·4 dwts. over 36 inches. East winze to 19th level: Driven or sunk, 53 feet; average assay value, 8·7 dwts. over 36 inches. West winze to 19th level: Driven or sunk, 33 feet; average assay value, 39·0 dwts. over 36 inches. East winze to 20th level: Driven or sunk, 52 feet; average assay value, 11·05 dwts. over 36 inches. South Reef.—19th level, east drive: Driven or sunk, 165 feet; average assay value, 6·8 dwts. over 60 inches. 19th level, west drive: Driven or sunk, 185 feet; average assay value, 4·4 dwts. over 60 inches. I take this opportunity of announcing that the board has resolved to declare an interim dividend of 30 per cent. (equal to 6s. per share) for the half-year ending June 30 next, and payable to all shareholders registered on that date.

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Rhodesian Section.

LATEST MINING NEWS.

The Tanganyika Report—Somabula Diamond Diggings—The April Output—The Fred Mine—Position at the Lonely—Globe and Phoenix—Mr. Piper's Report—The Pickstone.

As the years go by and new reports and statements of accounts are issued it must become increasingly evident to shareholders in the Tanganyika Concessions, Ltd., that the establishment of a successful copper mining industry in South Central Africa is not easy of achievement. It is stated by Reuter, wiring from London, that the report of the Tanganyika Concessions Company shows a net loss for the year of £136,116, which has been written off the share premium account. Two furnaces capable of treating 4,000 tons of ore monthly have been built at Lubumbashi and are expected to be running by the end of June. We have no doubt that in the course of time copper mining in the Katanga district of the Congo Free State will become an important and flourishing industry, but as we have all along remarked, it will take a good few years to attain to anything approaching a dividend paying state of affairs.

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The latest news from the Somabula diggings is of a very gratifying character. Mr. D. P. Rousseau, a digger licenced by the South African Option Syndicate, Ltd., recently found a beautiful 36¼ carat diamond—a perfect octahedron. This is the largest stone ever found on the fields. Sir John Willoughby once found a diamond in the same vicinity that weighed 19 15/16 carats, but which was not of such fine quality. Mr. Harry Lloyd, another licensed digger, not long ago found a good stone of 7¼ carats, and more recently three perfect stones of three carats each, which realised high prices—this apart from other smaller finds made by him. Since the start of the rains the diggers near the Spruit have been drowned out, and unable to work their ground, but now that the rains have ceased, it is expected that the output of diamonds will considerably increase. Some of those workings at Somabula are now carrying their drives at considerable depth—a new departure—and one of the principal of these has about one thousand loads on the surface, and a further four thousand loads ready for "stoping," preparatory to commencing washing, which is about to begin.

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The mineral yield of Rhodesia for April, which was dealt with at length in our last issue, compares very favourably with that for March, seeing that in the latter month there was declared by the Globe and Phoenix mine 4,764 ozs. of accumulated reserve gold. The actual yield of gold during April thus works out at 1,909 ozs. per day as compared with a daily yield of 1,822 ozs. in March. Excluding reserves the return for April is the highest recorded in respect of any one month since August, 1911, and brings the total gold production for the first four months of the year to 16,000 ozs. in excess of that for the corresponding four months of last year. The coal output, too, advanced from 13,156 tons in April of last year to 19,041 tons for the same month of this year, while in the other items—silver, lead, and chrome iron—the usual fluctuations are shown. In regard to the gold returns it will be noticed that the Bulawayo district is fully maintaining its output, there being in the shorter month of April a drop of only 100 ozs. in the total. In the Gwelo district the output is well maintained, the yield for the month being £77,053 as compared with £74,570, eliminating reserves, in March. A recent new producer figuring prominently in this district is the Moss, which, tributed by Messrs. James and Morrisby from the Exploring Lands and Minerals Co., gave a return of 516 ozs. from only 231 tons, as compared with 226 ozs. in the previous month. The Beacon Hill, in the Umvuma district, makes a striking return of 336 ozs. from 145 tons, and the Broad Arrow again figures in the returns. Improved yields from the Csardas, Globe, Wanderer, and a few smaller properties, contribute to the satisfactory total. In the Hartley district returns were in nearly every case on a par with, and therefore better than those for the longer month of March, with an increased total for the whole district. The Mint and Rowdy Boys figure in the Lomagundi district, and contribute to the increase of about £500 in value which is shown.

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It is understood by the *Rhodesian Mining Review* that recent development work on the lowest level at the Fred Mine, in the Filabusi district, has been showing very good results, both as regards the length of the payshoot and values. It is said that in consequence of this improved state of affairs the management (the Amalgamated Properties of Rhodesia) have in contemplation the addition of a further five stamps and grinding pans. With this change made, the monthly output from the property should be in the neighbourhood of a regular 800 or 900 ozs.

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From the report of the directors of the Lonely Reef Gold Mining Company for 1912, it will be seen that good progress was made at the mine during the year under review. The goal aimed at has been to increase the ore reserves, and this the management succeeded in doing, for the development done brought into reserve 71,480 tons. At the beginning of the year, there were 140,344 tons in reserve, and as 37,655 tons were crushed, the reserve at the end of 1912 amounted to 174,529 tons. Calculations show this to have an assay value of 22·4 dwts. to the ton. The company's milling plant now consists of 15 stamps and three tube mills, and the aggregate tonnage crushed for the year yielded gold worth £160,179. Disappointment is felt with the quantity of rock crushed, for it had been anticipated that 4,000 tons per month could be handled. Accidents, however, obviated the full capacity of the plant being attained. Owing to the small tonnage treated, and the heavy expenditure on replacements and breakages, working costs were high, but Mr. Francis Drake (the consulting engineer) foreshadows a substantial reduction during the current year. He concludes his report with the encouraging statement that the lowest workings show no evidence that good results will not continue, and shareholders may therefore assume that the mine has a long life before it. In view of the large high grade ore reserves, he says the outlook for continuous and profitable mining is particularly bright.

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In concluding his report on the operations of the Globe and Phoenix Company for the past year, the consulting engineer, Mr. H. A. Piper, writes:—It is most satisfactory to know that excellent extraction can be confidently expected from the new sand plant. With sands residues as low at ·6 dwt., and slimes at 1·7 dwt. a theoretical extraction is indicated on a 35 dwt. feed of about 97 per cent., but this cannot be expected on a lower grade of ore. It will be noticed that we are drawing heavily on our reserve of abnormally high-grade rock. This, as already mentioned, is due to our not having opened up any blocks of this nature during the year, nor does it seem likely that we will do so during 1913. This is due to the fact that the northerly pitch of the reef has carried the section of the combined reefs hitherto our highest grade portion, into the area of the disturbed ground in which the reef has quite died out. Also, at the 19th and probably at the 20th, to rely solely on the west portion (which, fortunately, has shown decided improvement) and the far north shoot north of the disturbed area. This latter we have not yet exposed at the 19th, but at the moment of writing we are on good values at both ends of it, *i.e.*, in the drive north and in the winze from the 18th, 230 feet further north. It should be mentioned that the sections now producing at the 19th are all narrow and that we have no 4 and 5 feet width such as we had at the 15th, 16th and 17th levels north of the junction, and consequently the cost per ton of ore developed is increasing. A comparison of the 17th, 18th and 19th levels shows the approximate position:—17th level: 1,444 feet averaging 31·0 dwts. over 33·3 inches; 18th level: 1,169 feet averaging 28·7 dwts. over 34·4 inches; 19th level: 1,147 feet averaging 16·1 dwts. over 31·1 inches, or 667 feet averaging 25·1 dwts. over 31·3 inches. (The lower figure for the 19th level excludes two low grade sections.) To the 19th level there will probably be added about 250 feet on the northern shoot at a lower grade. Therefore it is evident that the position of the mine in depth shows considerable improvement since the last yearly report, and when taken in conjunction with the winzes being taken from the 19th to 20th levels, which give very encouraging results, the position gives less cause for anxiety; at the same time it must be borne in mind that the values and tonnage per level will show a considerable decrease. A hopeful sign is that the disturbed area in depth now shows no sign of increasing.

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The following particulars respecting the operations of the Pickstone mine are gathered from the manager's report for the month of April:—Pickstone No. 1 east extension: 182 feet of development work was done during the month; 1,320 tons of ore treated giving 657·01 ozs. of fine gold, resulting in a profit of approximately £1,500. Pickstone West: The contractors have made satisfactory progress in erecting large bins for ore mined from the open cut workings in the gold bearing haematite body, and a large tonnage is now at grass ready for crushing as soon as the remainder of the crushing plant is installed. The new ten gravity stamps are giving every satisfaction, and it is expected that the two large Tangye gas engines will be under way at an early date. Whilst excavating for the sumps of the new cyanide plant, at a distance of 400 feet to the south of the quartz reef now being worked, a quantity of very promising quartz rubble carrying visible gold was encountered. This is apparently on the same horizon as the reef found in the new compound and as soon as the present pressure on native labour is relieved, systematic prospecting of this ground will be taken in hand. The mine continues to maintain its promising prospects.

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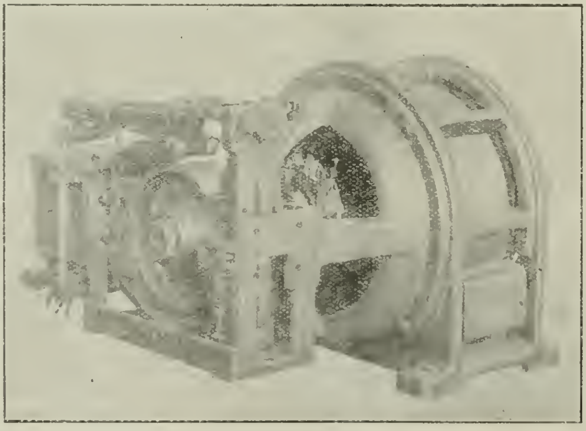

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GEOLOGICAL SURVEY REPORT FOR 1912.

A Review of Work Done.

Mr. H. B. Maufe, the Director of the Geological Survey of Southern Rhodesia, writes:—

I have the honour to present the annual report of the Geological Survey for the year 1912, being the report of operations for the second complete year since the establishment of the Department. Good progress has been made in systematic mapping in defining the series of metamorphic rocks which go to make up the schist belts, and in the establishment of the succession and structure of the Karoo rocks in the Wankie coal field. In addition to the systematic mapping of certain mineral fields, opportunity has been taken to reconnoitre other districts, and the evidence collected on these traverses helps to confirm the detailed work of special areas, and to show that the conclusions reached there have in many cases more than a purely local value.

METAMORPHIC ROCKS.

Classification. As a result of the detailed work amongst the metamorphic rocks, it is becoming increasingly clear that they are divisible into three series, one of which consists of three groups: (a) a greenstone schist group, including epidiorite, (b) a banded ironstone group, and (c) a conglomerate and grit group. These are at present largely lithological groups, and will probably require subdivision. The second series consists of ultra-basic rocks, some of which contain chromite and asbestos. The third series comprises a very variable group of fine-grained and frequently schistose acid rocks, which have not hitherto been recognised as a distinct series. *Gold Reefs.*—The recognition of these three series into which the metamorphic rocks may be divided, coupled with a consideration of the distribution of gold-bearing quartz reefs and the mode of occurrence of an important class of auriferous impregnations, has led up to what is probably the point of greatest practical importance resulting from the year's work, viz., that the gold deposits of the Territory are closely associated with the last-named series of acid igneous rocks. The statement rests at present on a general impression created by the field evidence, but the experience has been repeated so often that coincidence seems to be excluded. From some points of view it would be preferable to wait until the evidence can be presented in a complete form, but, as the subject has a direct bearing on prospecting, it is deemed advisable to draw the attention of prospectors and mining engineers to it at once. For if, as it seems, there is a close relationship between the gold ores and a group of acid rocks, a knowledge of the character and behaviour of the latter would be valuable to the prospector, giving him a rational guide in examining new ground, and a lead to the discovery of new ore-bodies. A preliminary statement will be published, by means of which it is hoped that mining men interested in the subject may be enabled to test the generalisation in their own experience. Field work amongst the metamorphic rocks has been carried out in the Selukwe, Gatooma, Enterprise, Abercorn, and Mazoe districts. The survey of the Selukwe district, begun in 1911, was carried northwards by Mr. Zealley and myself up to an east and west line drawn a short distance north of Surprise. This work completes the geological and a certain amount of topographical, mapping of an area around Selukwe, amounting to about 400 square miles, and embracing what may be described as the Selukwe mineral belt. The groups of rocks in the country mapped last year include representatives of all those given in the report for 1911. It has been found advisable to include with the epidiorites an extensive series of schistose and massive basic igneous rocks, which it is proposed to call the greenstone schist group. The gold ores found in the schists north of Selukwe are chiefly formed in shatter-zones, which have been impregnated with quartz and auriferous pyrite. Most of these ore-bodies occur in a country of banded ironstone, though they are not confined to it. Auriferous quartz veins containing sulphides (frequently galena) are found in all groups of the schists. It is hoped that the full account accompanied by the geological map will be made public during 1913. Upon the reported discovery of tin near Selukwe, Mr. Zealley made a special examination of the locations. He found that various minerals were mistaken for tin-stone, which itself was not discovered. After finishing his work in Selukwe, Mr. Zealley was transferred to Gatooma, commencing the survey of this important gold field by the mapping of the Eiffel Flats and neighbourhood. His preliminary report gives a sketch of the geology of the district, but treats especially of certain geological aspects of the gold reefs. It is proposed to issue this in separate form at an early date. The mapping of the Enterprise mineral field, embracing an area of 160 square miles, has been completed by myself. This schist belt consists of members of the epidiorite and banded ironstone groups which have been folded and invaded by numerous small masses of fine-grained acid igneous rock. The gold deposits of this district include quartz veins, but the majority are bodies of mineralised rock, which consist either partly or wholly of the fine-grained acid igneous rock mentioned above. The geological map and the report will be prepared for publication during 1913. I spent about two months in making a geological reconnaissance of the Abercorn district and the Mazoe Valley above the confluence with the [illegible] River. A good general notion of the geological structure of the district was obtained, but a point on which information was especially desired, viz., the relation of the Shamva grits to the other metamorphic rocks, was not settled. A number of the Abercorn tin reefs were examined and found to be essentially similar in their geological occurrence to those of Victoria and Enterprise. A great deal of interesting information was collected relating to the association of the gold ores with acid igneous rocks.

KAROO SYSTEM

The north-western portion of the Wankie coal field, including the main basin in which the colliery is situated, has been mapped by Mr. Lightfoot. This work involved the making of a topographical map of the area, those in existence being too inaccurate for the purpose. The geological work has determined the succession of rocks and the structure of this field. The discovery of fossil plants is interesting, as proving what perhaps was never seriously doubted by geologists, that the Wankie coal beds belong to the lower part of the Karoo system. The main coal seam is known to be a very thick one, and the best in the sub-continent for steam-raising purposes. The survey of the district now shows that the basin in which the colliery is situated, although bounded in part by faults, is simple in structure, and remarkably free from faults and other disturbances. Estimates of the resources of the field made previous to the survey showed a very large reserve. Not only is this now confirmed, but a large addition may be made with considerable confidence. Mr. Lightfoot points out that it is probable 600,000,000 tons of coal could be taken out of the district mapped by him. The geological map and report are in an advanced stage of preparation. Their publication should be of assistance to engineers examining other coal fields in the Territory. *Coal Resources.*—The question of the coal resources of Rhodesia generally has also occupied the attention of the survey. At the request of the Committee of the International Geological Congress, an estimate was prepared for their forthcoming report on the coal resources of the world. The estimate is believed to be an exceedingly moderate one, in view of the fact that only those seams were taken into account the quality of which was known from analysis and the extent of which was known from prospecting operations. In fact, as a result of the survey of the Wankie field, the total may be raised by the addition of 400,000,000 tons. The revised total gives 969,411,000 tons, of which 825,852,000 tons, or 85 per cent., are steam coal, the remainder including both semi-anthracite and bituminous coals.

OTHER WORK.

Limestone and Cement-making Materials.—Early in the year investigations were made, partly in conjunction with the Chemist to the Agricultural Department, into a number of deposits of limestone and clay, with special reference to their suitability for the manufacture of Portland cement. These proved to be of use almost immediately in connection with enquiries received from outside the Territory as to the occurrence of suitable cement-making materials in Rhodesia. A syndicate has proved by trial tests to its own satisfaction that a Portland cement exceeding the requirements of the revised British standard specification in strength, etc., can be made out of materials occurring near Bulawayo, and that a sufficient quantity of these materials is available. *Soils.*—Observations on the relation of the soil, or more accurately the sub-soil, to the underlying rocks have resulted in the collection of a considerable amount of evidence showing that the soils are largely residual accumulations, and that two of the most important factors in determining their character are (1) the nature of the underlying rocks, and (2) the behaviour of the soil-water. To work out these problems systematically, provision for analyses of rocks and sub-soils would have to be made. There can be no doubt that the results would have an important bearing on the classification of new lands and the treatment they should receive. *Water.*—At the request of the Bulawayo Municipality, I examined the environs of Bulawayo, and located sites for wells intended as a temporary supply for the town, to meet the shortage caused by the deficiency in the rainfall. The sites chosen lie in a belt of well-jointed rock, which is the fine-grained margin of the granite mass situated to the west of the town. *Enquiries.*—Numerous other questions have been dealt with which have arisen from enquiries for information received from Government departments, companies and individuals.

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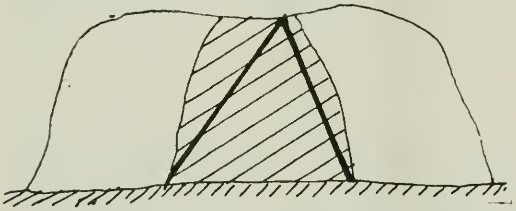
MINE SAMPLING AND ORE VALUATION, WITH SPECIAL REFERENCE TO THE WITWATERSRAND AREA.—VII.

[By Arthur S. Lejeune.]

Chapter VI.—Sampling of Dumps.

It is frequently necessary to obtain a value of ore or waste stored in a dump and the methods of sampling these dumps depend on the nature of the material in the dump.

(1) *Ore Dump Containing Much Fines.*—These are rather more difficult to sample than dumps composed of coarser material. Two cases, however, present themselves:—(a) It may be necessary to obtain the value of all the material a dump contains. This would be the case in a shipment of ore. In this case the whole of the ore is spread out on the ground in a flat pile representing a truncated cone, but the height of which is small. The next thing to be done is to dig trenches through this pile dividing it into several portions. Then walk along these trenches and every few paces take a small shovelful as a sample. These portions are afterwards well mixed together and quartered down to a convenient size. When the ore is composed of large lumps the same procedure is resorted to as above except that a shovel is not used but that lumps are taken on each side of the trench at every few paces. The greatest care should be taken in this case that the piece of rock at the measured distance is taken no matter whether it be rich or poor. The reason for this remark is that if a rich piece and a poor piece are lying together a mental bias will suggest that either one or the other be taken. No matter how fair-minded a sampler may be, experience has shown that there is always a tendency to prejudice the sample either one way or the other. More will be said in connection with this matter in dealing with the sampling of waste rock dumps. (b) It may occur that the rock from a certain part of a dump only is being milled, and therefore the value of this part is required. The method of procedure then is as follows:—



In the above figure the hatched portion is the portion of the dump that is being sent to the mill. The dump could then be sampled at even distances along the heavy black line. There are, however, several methods in which the sampling could be done and the above is only one of them; in the opinion of the author, however, one of the best.

Sampling of Waste Dumps.—The question of mental bias is of greater importance in this case than in any other for the following reason:—The sorting is never theoretically perfect and therefore a considerable quantity of reef may find its way to the waste dump. This being the case there is a tendency to include more reef in the sample than there should be. Probably the best time to sample a waste dump is on a moonlight night when there is just sufficient light to work by but not enough to be able to distinguish reef from waste. Pieces, large and small, are thrown off the dump until about a ton is collected. This then represents the sample which has to be broken down and quartered to a convenient size.

Sampling of Tailings Dumps.—As all the material of a tailings dump is fine there is no means of prejudicing a sample in any way. The sample may be taken either by means of a shovel or by means of a tube. The tube is pushed into the dump at the required spot and drawn out again. What is contained in the tube is put into the sample.

Sampling of Pulp.—The best method of sampling flowing pulp is to divert the entire stream for a short time and repeat this at regular intervals of time as long as the pulp is flowing. Where, however, this is not practicable a long pipe may be inserted in the stream and in this way a certain portion of the stream flows through the pipe and may be collected in a bucket. It is possible that neither of these methods may be suitable. If the stream is a broad flat one a bucket may be moved from one side to the other at the point of discharge. This enables a sample to be taken from every part of the stream at almost the same time.

Kolmanskop Diamonds.

The output of diamonds from this company's property at Luderitzbucht for the month of May was 9,532 carats.

Neumann Group.

The following particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	Tons. Crushed.	Yield.	Profit.
Wit. Deep	47,370	£67,310	£27,160
Wolhuter	30,000	37,436	10,324
Cons. Main Reef	24,542	35,807	11,087
Main Reef West	21,330	30,853	6,477
Knight Central	26,000	27,569	2,008
Total for group			£57,056

The Meyer and Charlton.

The directors of the Meyer and Charlton G.M. Co. have declared an interim dividend of 30 per cent. (6s. per share) for the half-year ending June 30, payable to all shareholders registered at that date and to holders of coupon No. 30 attached to share warrants to bearer.

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SIR DAVID HARRIS ON "DIAMOND-CUTTING."

Evidence Before the Select Committee—Some Inaccuracies Corrected.

THE evidence given before the Senate Select Committee on the diamond cutting industry has been issued. Among the witnesses was Colonel Sir David Harris, M.L.A., director of De Beers, who was one of the principal witnesses, and who began his evidence by correcting some inaccuracies. He first of all disposed of the statement that during the last forty years "the profits from the diamond industry had been flung at the feet of Europe," pointing out that for the first twenty years of the existence of the industry there were no profits at all. It was only after the amalgamation at Kimberley that profits were made. Another inaccuracy was the statement that only 4,000 whites were engaged in the industry. The total number is 9,703. Another misstatement was that the proportion of the world's diamonds produced in the Union was 98 per cent. of the whole; the proportion is really about 77 per cent. In reply to Senator Moor, Sir David Harris said that practically the Union produces £10,000,000 worth of diamonds per annum, German South-West Africa a little over 2½ million pounds worth, and Australia and Brazil not more than £250,000.

So the world's production is practically confined to the Union and German South-West Africa?—Yes.

WHAT WE OWE TO DIAMONDS.

Another inaccuracy which Sir David pointed out was the statement that "practically all this country had obtained of the £150,000,000 worth of diamonds produced since the opening of the diamond fields was the getting out of the stones by Kaffir and convict labour, while the cream of the profits had gone to Europe." He recalled an article which he wrote at the time of Union, which showed that out of the £140,000,000 worth of diamonds produced in the Colony then, not quite £40,000,000 went for interest, reduction of debentures, and dividends, so that practically the other £100,000,000 was spent in the Colony. In addition to that, no account was taken of the enormous sums spent for Colonial produce, coal, railway rates, and so on.

All that, I take it, is included in the £100,000,000?—Yes. Now, as South Africa is a very poor consumer of the polished diamonds, and a much larger consumer of woollen goods, I think it would be better to try the experiment of getting some of the manufacturers of Leeds and Bradford to come here with cloth factories. If the Union were a large consumer of diamonds, then I think you could approach this matter in a spirit of patriotism.

Sir David also pointed out that by establishing an industry here, the cost of cutting would be increased 100 per cent. "About £5,000,000 a year is spent on cutting and polishing. Well, if that were doubled it would be £10,000,000, and on the assumption that the world is only prepared to take about £15,000,000 worth of cut diamonds from the trade, then the output would be reduced proportionately, and then for every diamond cutter you brought into this country a skilled mechanic or overseer would be dismissed from the mines of the Union." Sir David also pointed out that the system of banking on the Continent is different from the system in England and the Colonies, and said you could not finance the diamond cutting industry here, as the banks have not the money or the resources.

ILLICIT TRAFFIC.

The Chairman asked Sir David: Would you like to see a diamond cutting industry established here? "No," was the reply, "because it would injure my prospects and also the prospects of the State, because if you had 5,000 polishers and cutters here you would have 5,000 less white men on the mines." Have you or your company ever made any attempt to get cutters here?—No, we are afraid of the illicit trade. As it is, we are losing an enormous number of diamonds through illicit traffic. I have had experience in the diamond trade for over forty years, and I ought to know something about it. If a thousand rough diamonds came before you, you could recognise 500 of those stones again in the rough, but not one of them if polished, and that is why I say if you have a cutting industry here you would open the door to illicit traffic, and I daresay there are a good many people in this country who would be only too delighted to see a diamond cutting industry established here for that reason. Do you think that prohibition of the export of uncut stones would have the effect of hampering the trade and industry here?—It would paralyse it. You would not be able to sell diamonds here, and some of the mines would close down.

PULSE OF THE MARKET.

Replying to other questions, Sir David said that in the last twenty years the price of diamonds has increased 100 per cent. The output in weight had also increased very much, but he could not say how much. The working expenses have also increased, because the deeper you go the greater are the working expenses. "How does that bear out your argument that if Government put on a 15 per cent. export on rough stones the world's demand for diamonds would decrease?"—"We are in such a position to feel the pulse of the market that we know when diamonds have reached their maximum price you cannot squeeze more out of the market. It is dangerous to raise the prices higher."

MINING MEN AND MATTERS.

At the invitation of the Governor-General of Mozambique, the South African Association for the Advancement of Science is this year holding its annual congress at Lourenco Marques, from July 7 to July 12, inclusive. This is a unique event in the history of the Association, as it has never before met outside British territory. The Portuguese authorities at Lourenco Marques are determined to make the meeting a most enjoyable one, and they have arranged a very complete and attractive programme of festivities.

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Mr. R. J. H. Allen, of the Anglo-French Exploration Co.'s engineering staff, left on a visit to the Old Country by the last Imperial mail.

* * * *

Mr. F. R. Lynch, sub-manager of the Consolidated Mines Selection Company, left for England by the last Imperial mail.

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Major Charles van Bredael, late Commissioner of the Lualaba-Kasai district (Congo), and M. Albert Diehl, of Brussels, have joined the Board of the Oceana Development Company, Ltd., representing Katanga mining interests.

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Messrs. H. H. Johnson & Co., mining engineers, Moorgate Station Chambers, E.C., have appointed Mr. Colin Campbell as their local representative in Salisbury, Rhodesia. Mr. H. H. Johnson is at present in British Columbia.

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We regret to announce the death, which took place this week, of Mr. John McKillican, the well-known accountant and auditor, member of the Johannesburg Stock Exchange, and Rand Pioneer.

* * * *

Mr. Reginald S. Innes, Assoc.Inst.M.M., has sailed for the Congo Belge.

* * * *

Mr. Dudley J. Inskipp, Assoc.Inst.M.M., has returned to London from Rhodesia.

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At a meeting of the Institution of Mining and Metallurgy held in London on May 22nd, a paper by Mr. B. D. Bushell, manager of Springs Mines, was read on sinking operations at that property.

South African Mining Journal

REMOVAL OF OFFICES.

The Offices of the SOUTH AFRICAN MINING JOURNAL are now situated at Nos. 176 to 180, STOCK EXCHANGE BUILDINGS, Fox Street, Johannesburg—(2nd Floor).

FUTURE OF THE ROBINSON.

"Life" Question Discussed—Amalgamation with Crown Mines Possible.

In the absence of Mr. E. A. Wallers, Mr. H. C. Boyd presided at the Robinson meeting this week, and dealt with the questions of "life" and amalgamation as follows:—

A number of shareholders have asked that a definite statement should be made at this meeting regarding the life of the mine. Your directors would gladly comply with this request if it were possible to do so with accuracy, but unfortunately it is not possible. The above figures reflect the position of the mine as regards known payable ore reserves as accurately as possible; as already indicated, a little development yet remains to be done on the south reef and leader blocks, and a fairly accurate guess could be made as to what that development will disclose, but we should still be unable to say how much will eventually be recovered from the old workings and how much main reef will be milled at a profit. The supply of labour available must, in the main, decide the rate at which the main reef can be mined, and the total tonnage that can be crushed during any given period. The scale of operations will largely decide what our working costs will be, and these again will decide how much of that reef can be treated profitably. The importance of crushing the maximum amount of main reef at a profit was dealt with by the chairman last year, and is specially referred to in the consulting engineer's report now before you. It is owing to the greatly improved labour position that we have this year been able to increase so greatly the amount of main reef mined and, consequently, the total amount of ore milled, which for the past three months has averaged about 60,000 tons monthly; last month 62,600 tons were milled, of which about 25.000 tons were main reef. The grade recovered has naturally decreased, being as low as 34s. 2d. per ton in April, but costs per ton have been favourably affected, being for March and April about 2s. a ton lower than those ruling last year, and for last month probably still lower. The total working profit, including profit from accumulated slimes, etc., for the first four months of this year has been £254,133. The large capital expenditure incurred during 1911 on the Butters Filter plant has been fully justified: it is through its use that the plant can now be rated at 60,000 tons capacity for a thirty-day month, and in addition residues and cost of treatment have been further reduced. It is not possible to-day to give exact figures, but if the Bill now before Parliament, dealing with the disposal of the moneys accruing through the leasing of the undermining rights of bewaarplaatsen, becomes law, this company will be benefited to the extent of about £160,000, the bulk of which will be receivable in the next four years. The bulk of our native labourers from tropical areas will not leave till November, when we may hope that their places will have been satisfactorily filled. In common with other mines here, we have taken every precaution suggested to us to safeguard the health of these boys, and we greatly regret the high death-rate which has generally obtained among them. You have doubtless seen references in the newspapers to the possible amalgamation of this company with the Crown Mines, Limited. Any such announcement was quite premature, as the respective Boards have not considered any definite proposition. Representations have frequently been made to your Board as to the desirability of extending our shareholders' interest in the mining industry here, and, tentatively, there have been discussions regarding the amalgamation of these two companies. This premature announcement has, however, enabled your directors to obtain the information which they first of all desired to have before attempting to further this project—namely, whether the idea, in principle, would be welcomed by our shareholders. From the numerous favourable references to it in the newspapers, it is clear that it would be welcomed, and we have similar assurances from the principle representatives of the French shareholders, who form so large a proportion of the proprietors of this company. There appears to be no doubt that if equitable terms can be arrived at, such an amalgamation would be mutually advantageous to the two companies. The matter is by no means being lost sight of, but before your directors can be in a position to recommend any scheme for acceptance by our shareholders, very exhaustive technical examination of the properties is naturally required. Shareholders will be fully advised if and when further developments take place, and any agreement which may be come to will be purely provisional and subject to their approval. As you were advised in the quarterly report issued last month, your directors decided to invest some of the company's funds in Crown Mines shares. Altogether 37,500 of these shares have been purchased. This policy of acquiring other interests renders the reduction of the current rate of dividend advisable, and it is therefore probable that the dividend for the first half of the year, to be declared this month, will be restricted to 8s. per share.

BRIGHTER PROSPECTS FOR THE AURORA WEST.

Improved Ore Reserve Position—Liquidation of Company's Debt.

Questions of finance and ore reserves were the principal matters dealt with by Mr. George Nathan at the annual meeting of the Aurora West Company last week end. Of the former, the Chairman said:—

Turning to the subject of the ore reserves, you will see that these have been very appreciably enlarged during the past year, notwithstanding the greater tonnage milled for the period. The increase from 345,578 milling tons of fully developed payable and 69,064 tons of partially developed payable ore, at the end of 1911, to 467.064 milling tons of fully developed payable, and 112.183 tons of partially developed payable ore at the 31st of December last, is a highly satisfactory achievement, more especially as the actual cost of the ore developed during the year was at least 1s. per ton less than the monthly charge of 3s. per ton milled made to working costs for development redemption for the same period. For these reasons, the total charge to capital expenditure for excess development for the year only amounts to £1,579, which is equivalent to less than 2d. per ton in respect of the 194,605 tons of fully and partially developed ore added to the reserves during 1912. Referring for a moment to the results obtained during the current year, you may have noticed that the yield per ton of the ore treated has risen from the average of 24s. 9d. for last year to a recovery varying from 26s. 4d. to 28s. per ton. This is due to some extent to an improvement in stope values, but also to a rearrangement of sorting methods instituted in the latter part of last year, and which has enabled us to increase the percentage of waste rock sorted out on the surface from approximately 15 per cent. of the total ore hoisted to 20 per cent. I think, gentlemen, that in the foregoing remarks I have demonstrated that the main essentials of a successful mining proposition are existent in the instance of your company. The profits have steadily improved, and the improvement is being fully maintained; the ore reserves have appreciably increased, without any diminution in value, to an equivalent of more than three years' supply ahead of the mill; as regards the "life" of the mine, we have satisfied ourselves that this is likely to be a long one. The only other really important question which is exercising our minds is the liquidation of the company's liabilities for advances made by the General Mining and Finance Corporation. I have already pointed out that no satisfactory scheme in this direction could be laid before you during the past year, or up to the present time, by reason of the unsettled condition of affairs in Europe, but now that the outlook in the latter direction has changed for the better, I am hopeful that we shall in the near future be able to submit proposals for capitalising the debt, on equitable terms, by the creation and issue of the new shares referred to in my opening remarks. In this event, I may reiterate the statement made by your chairman at the extraordinary general meeting held on the 18th of May last year, that we shall endeavour to arrange that a certain proportion of the new shares shall be offered at the issue price to all shareholders of the company, and I may again remind you that if the whole of the reserve shares be issued and taken up, the capital of your company will only amount to £300,000, that not alone will future profits be released for distribution to shareholders, but also that there will be a considerable amount of surplus cash available for any further capital expenditure, and other purposes, that might be deemed advisable in the interests of the company.

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CAUTIOUS POLICY AT THE KNIGHT CENTRAL.

Husbanding Resources for Development—Prospects South of the Simmer Dyke.

DEALING with the position of the Knight Central, at the annual meeting of the company this week, Mr. A. G. Gill said, *inter alia* :—

There is only a small amount of development still to be done north of the dyke, so you will understand that, unless a large percentage of payable ore is opened up, south of the dyke, in the 13th and 14th levels, west shaft, and the 15th and 16th levels, east shaft, there will be a gradual depletion of the ore reserves, these being the only points where it will be possible to open up any large quantities of ore during the next twelve months. In the meantime the sinking of the incline shafts from the 14th level, west shaft, and the 15th level, east shaft, will be pushed on as rapidly as possible, and the question of building up the ore reserves will naturally depend on the results obtained from the development work that will be done from those shafts. It is as well to tell you that since the striking of the reef in the 14th level crosscut, west, some 90 feet of driving has been done on the reef, with indifferent results, the first few feet giving high values and the balance being poor. The work outlined above, together with the necessary hoists, etc., that will have to be installed, owing to the present hauling plant having reached the limit of its capacity, means the expenditure of a large amount of money, but, in addition to the profit that will be earned from month to month, you have to-day available cash amounting to £100,000; this is apart from sundry cash assets, such as stores, Victoria Falls Power Company shares, etc., and I feel sure that those who so severely criticised the directors for again passing the dividend in December last will be generous enough to admit that they acted in the best interests of the company, seeing that their policy has fortunately resulted in your being in a very strong financial position just at the time when heavy expenditure has become unavoidable. You will realise that it would be far more pleasant for me if I could make a more encouraging statement regarding the position at the mine, but facts are against me, and I have endeavoured to be perfectly frank with you.

QUARTERLY REPORTS.

Glencairn.

Revenue, £47,082, or 15s. 0·314d. per ton, from 61,486 tons milled; cost, £42,002, or 13s. 0·662d. per ton; profit, £5,079, or 1s. 0·652d. per ton; total yield, 11,084 ounces; capital expenditure, nil. The quantity of ore crushed was less than that for the preceding quarter by 3,218 tons. This, together with an increase in working costs, had an adverse effect on the gross profit, which was reduced by £1,776. Steady progress has been made with the development of the Knights Tribute section, and the values exposed show a slightly improving tendency.

Roodepoort United.

Revenue from mill, 10,687·49 ozs., valued at £45,277 2s. 3d., or 11s. 5·74d. per ton; from cyanide, 6,904·02 ozs., valued at £29,262 12s. 8d., or 7s. 5·02d. per ton; sundry revenue, £300 11s. 9d.; cost £76,628 9s. 4d., or 19s. 5·12d. per ton; lost £1,788 2s. 8d., or 5·44d. per ton; capital expenditure, £6,514 7s. 8d. Mining operations during the quarter were seriously affected by the accident at the Kimberley main shaft, through an overwind which wrecked the upper portion of the steel headgear and damaged the engine-house. The working expenditure above detailed includes the cost of the necessary repairs and replacements to the headgear and buildings. The grade of the ore milled continued low. Tons milled in quarter, 78,891.

Cinderella Consolidated.

Revenue from mill, 9,157·04 ozs., valued at £38,811 19s. 6d., or 14s. 0·84d. per ton; from cyanide, 7,801·33 ozs., or 11s. 11·66d. per ton; sundry revenue, £838 14s. 10d.; costs £72,831 9s. 5d., or 26s. 4·83d. per ton; loss £157 3s. 6d., or 0·68d. per ton; tons milled, 55,170; capital expenditure, £30,957 7s. 9d. The unsatisfactory result of mining operations for the quarter under review is due to the excessively high level of working costs consequent on abnormal working conditions in the mine. Sinking was resumed in the central shaft at the end of January, and 191 feet were sunk for the quarter, making a total depth of 2,566 feet.

Ginsberg.

Revenue, £63,301, or 29s. 0·354d. per ton, from 43,130 tons milled; cost, £43,106, or 19s. 0·989d. per ton; profit, £20,195, or 9s. 0·356d. per ton; total yield, 14,902 ozs.; capital expenditure, £1,130. There was a slight increase in the working costs, and, as the quantity of ore crushed was less by 935 tons, the gross profit showed a reduction of £1,610 as compared with that for the quarter ended December 31. The north shaft was sunk 47 feet to an inclined depth of 1,745 feet. Work was suspended in the shaft to permit of the cutting of the tenth level station and ore bins at the ninth and tenth levels. The east drive at the ninth level continues to expose reef of good average value. Work in connection with the installation of a small plant for the treatment of accumulated slimes has been put in hand.

New Rietfontein.

Revenue, £56,116, or 23s. 0·207d. per ton, from 47,500 tons milled; cost, £47,550, or 20s. 0·021d. per ton; profit, £7,566, or 3s. 0·186d. per ton; total yield, 12,975 ounces; capital expenditure, £1,009. The quantity of ore crushed was increased by 1,420 tons, and there was a reduction in working costs of 1s. 5d. per ton as compared with the previous quarter. Unfortunately, several of the stopes showed a considerable fall in grade, with the result that the revenue from gold was reduced by over 2s. per ton, and the total gross profit was less by £1,433 than that for the quarter ending December 31, 1912. No. 1 shaft was sunk 42 feet to a total inclined depth of 1,641 feet. Development from this shaft continues to expose ore of poor value, but a small block of high-grade reef has been opened up as the result of development operations in the vicinity of the tenth level, No. 1 shaft.

Witwatersrand.

Revenue, £147,692, or 25s. 0·579d. per ton, from 115,480 tons milled; cost, £85,250, or 14s. 0.705d. per ton; profit, £62,412, or 10s. 0·814d. per ton; total yield, 34,769 ozs.; capital expenditure, £8,587. The amount expended on shaft-sinking and equipment of the southern section was £7,061 12s. 10d. The quantity of ore crushed was increased by 1,530 tons; working costs were practically unchanged, and the grade was improved by over 6d. per ton. As a result, the gross profit was higher by £3,318 as compared with that for the preceding quarter. Development results continue very satisfactory. At the northern incline shaft the grades of the ore exposed is above the average of the mine, and at the vertical shaft the second west drive has been extended 145 feet in reef of good value. The east drive is also in payable reef, although the grade is lower. A start has been made with the sinking of the southern incline shaft, and the shaft has reached an inclined depth of 69 feet. The extension to the reduction plant has been put in hand, and orders have been placed for five tube mills and seven cyanide tanks.

Princess Estate and G.M. Co.

During the three months ended the 31st March, 66,500 tons were milled, the revenue from gold was £85,302, or 25s. 7·858d. per ton. Working expenses, including £9,975 for mine development redemption, amounted to £80,069, or 24s. 0·97d. per ton, which left a working profit for the three months of £5,233, or 1s. 6·888d. per ton. Sundry revenue brought in £928, making the total receipts £6,161. Against this sum there is a charge for interest of £743, which left a balance of profit for the quarter of £5,418. Expenditure and revenue account, which includes capital expenditure, shows a balance to credit for the period of £2,410. On mine development 3,259 feet were driven, risen, sunk, etc. The footage driven, risen and sunk on the reef and sampled was as follows:—South Reef, 1,585 feet, averaging 7·7 dwts. over 25 inches; Main Reef, 1,175 feet, averaging 7·3 dwts. over 37·3 inches. It is estimated that the payable ore (based on the milling width) developed by the above footage is:—South Reef, 28,786 tons; Main Reef, 42,454 tons; total 71,240 tons. These figures are subject to recalculation at the end of the year when block values are made out.

South African Mining Journal

REMOVAL OF OFFICES.

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Miners' Phthisis Act.

Notice is given that the Minister of Mines, under the powers vested in him by section two of the Miners' Phthisis Act, 1912 (Act No. 19 of 1912), has withdrawn the undermentioned mines from the list of mines published under Government Notice No. 1028 of 1912 in the *Union Government Gazette* dated the 30th July, 1912, viz.:—Witwatersrand Gold Mines: Apex Mines, Ltd.; Benoni Consolidated Mines, Ltd.; Cloverfield Mines, Ltd.; New Boksburg Gold Mines, Ltd.; Vogelstruis Consolidated Deep, Ltd. Klerksdorp Gold Mines: Africander Proprietary Gold Mines, Ltd.; Rietkuil Gold Mines, Ltd.

Miners' Phthisis Act, 1912: Amendment to Regulations.

A regulation has been promulgated under Section 36 of the above Act, exempting any claimant for compensation resident outside the Union on the 4th April, 1913, who has received an allowance under the Miners' Phthisis Act, 1911, from obtaining a certificate of two medical advisers appointed under the Act, provided that he produces a certificate of a medical practitioner, accompanied by a certificate of a Mayor, Magistrate, or other responsible official, stating that such medical practitioner is qualified to practise in the town or district in which the claimant resides.

Eastleigh Diggings.

The diamond return for Eastleigh for the month of April is 603 carats sold for £4,198 12s. 6d. This result was anticipated, as many diggers have been hindered for a week or two by wet weather, and quite a number have been doing prospecting work on the ground recently proclaimed. The finds on the lower part of the farm amounted to 103¾ carats sold for £637 17s. 6d.

Swaziland Tin.

The following are the particulars in regard to operations for April, 1913:—Concentrates recovered, 42·432 long tons; estimated profit (taking the price of tin at £200 per ton), £3,759; adjustments in respect of previous shipments due to fluctuations in the price of tin, to be added, £360; profit for the month, £4,119. It is expected that the new power plant will be completed and the new gravel pumps (replacing hydraulic elevators) will be working about the middle of next month.

INVESTORS' DIARY.

The following company meetings have been announced:—

June 17.—Transvaal Consolidated Lands.
June 18.—Rand Mines.
June 27.—A. Goerz and Co.
July 4.—General Mining and Finance Corporation.
July 31.—Glynn's Lydenburg (Special).
Aug. 5.—City Deep.
Aug. 26.—Glynn's Lydenburg (Special).

Brakpan Mines.

The following information in respect of the May, 1913, output has been supplied:—Stamps working, 160; running time, 27 days; ore crushed, 56,439 tons; tube mills working, 8; ore hoisted, 66,337 tons; ore from dump, 830 tons; waste sorted, 15·23 per cent.; fine gold declared, 19,011 ozs.; value declared, £80,018, equal to 28s. 4d. per ton milled; working costs, £52,951, equal to 18s. 9d. per ton milled; working profit, £27,067, equal to 9s. 7d. per ton milled.

Manicaland Output.

The mineral output of the territory of the Companhia de Moçambique (Manicaland) for the month of April, 1913, was:—Reef:—Mill: Gold won (fine gold), 325 ozs.; tons crushed, 1,890, value £1,364 19s. Concentrates (estimated): Gold (fine gold), 37 ozs. 12 dwts.; tons, 7, value £159 17s.; silver and lead, value £48 8s. Cyanide: Gold recovered, 15 ozs. 12 dwts. 10 grs.; tons treated, 90, value £65 12s.

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TRADE LONDON MARK.

THE WEEK IN THE SHAREMARKET.

General Slump Affects South African Stocks—A Stringent Money Market Causes Liquidations—Local Market Maintains Firm Undertone.

As might have been expected, the declaration of Peace in Europe has been followed by an unexampled demand for money, and public issues have swamped the European money markets. The Powers, big and small, the British Colonies, and a host of municipal authorities have come out for big loans, and the effect has been to demoralize all money markets and to deal a severe blow at sharemarket activity. That this is the explanation of the slump of the past week is clear enough, reading between the lines of our attenuated cables. All Rand stocks are lower on the week, and quite a healthy shaking out has taken place. All this has occurred in the face of some excellent statements from the chair at important company meetings of the week, and anticipations of very satisfactory dividends to be declared next week. The popular favourites, Modders, State Mines, Springs and Van Ryn Deeps have all suffered from the general set-back, and lost much of their gains of the week before. All the heavies, of course, reflected the weakness and some receded to tempting levels. It is permissible to think that the set-back was a blessing in disguise, if it emphasised the comparative cheapness of some of the best Rand stocks. An excellent output for May, and good dividend declarations next week should soon put a different complexion on matters.

The Tin Market.

Quotations for all tin stocks naturally relapsed with the general market, and Zaaiplaats, which had risen most, felt the change most keenly. An excellent return for May is expected, and there is nothing to warrant the reduced quotation of the week. Rooibergs and Swazis are steady but lower.

Diamonds.

Diamond shares did not escape the prevailing depression, though one or two counters more than maintained their price. Frank Smiths developed weakness and fell to 13s. 3d. Any change in the general market rapidly affects this popular counter. Blaauwboschs were steady and Crowns in growing favour at from 9s. 3d. to 10s. Oranges were firm in the neighbourhood of 2s. and Nationals strengthened by about a shilling. Diamond shares are likely to become a popular feature again in a decent market, and the latest rumour from Paris of a big combine of Barnato and the Central Mining people to support the diamond market is much discussed. The fizzling out of both the South African and U.S.A. proposals to tax diamonds further has strengthened confidence in this section of the market. The Union Minister of Mines has definitely repudiated all intention on the part of the Government of disturbing the "economic balance of the diamond industry," and shareholders can now breathe freely again.

	Friday, 30th.	Mon., 2nd	Tues., 3rd.	Wed., 4th.	Thurs., 5th.
African Farms	17 0	17 0	16 9B	17 3	16 9
Apex Mines	25 9B	25 6B	24 9B	25 3B	24 0B
Bantjes Consolidated ..	21 0	21 0B	21 6	21 9	21 0
Benoni Consolidated ..	3 0	3 0B	3 3	3 0B	3 1B
Blaauwbosch Diam... ..	112 6a	—	—	—	—
Brakpan Mines	78 6B	79 0B	78 6B	79 0B	78 0B
Breyten Collieries	32 0s	—	32 0s	—	32 0s
British S.A.	—	—	21 0B	—	—
Bushveld Tins	0 6	—	1 0s	0 5	—
Cassel Coals	—	—	15 0B	15 0B	—
Cinderella Cons.	—	—	9 0s	—	—
City & Subs. (£4)	50 0	50 0B	50 6	50 6	51 0s
City Deeps	61 6	62 6B	62 0	62 0B	62 3
Cloverfield Mines	—	5 9B	5 6B	5 6	5 4B
Clydesdale Colls.	—	—	—	—	8 6B
Concrete Constr.	—	—	9 0B	—	—
Cons. Investment	—	—	—	21 0B	—
Cons. Langlaagtes	28 0s	—	26 9B	26 6B	26 3
Cons. Main Reefs	18 6B	19 0	18 6B	18 6B	18 6
Coronation Colls.	—	—	—	—	15 0B
Coronation Freeholds ..	0 5B	0 5B	0 5B	—	0 5B
Coronation Synd.	3 0B	—	—	—	—
Crown Diamonds	9 3	9 0B	—	9 3B	9 6
East Rand Centrals ..	9 9B	9 9B	9 9	9 6B	9 6B
East Rand Coals (2/6) ..	1 9B	1 10B	1 10	—	1 10B
East Rand Deeps	2 8s	—	—	2 3B	—
East Rand Props.	53 6B	53 0B	52 6B	52 6B	52 6s
East Rand Debs.	—	£95s	£93s	£94s	£93s
Eastern Golds (1/-)	1 6B	—	1 6B	1 6B	—
Frank Smith Diam. ..	13 9	14 0B	13 9B	13 6	13 3B
Geduld Props.	24 3B	24 6B	24 0B	24 0B	24 0B
Glencoe (Natal) Colls. ..	7 0B	7 0B	7 0B	7 0B	7 0B
Glyyn's Lydenburgs	17 6B	19 6s	19 0s	17 6B	18 0B
Government Areas	24 0	23 9	23 6	—	23 6
Hex River Expls.	0 6B	—	—	0 6B	—
Jumpers	—	1 0B	—	1 0B	—
Jupiters	10 0B	9 9B	10 0B	10 0B	10 0s
Kaalfontein D. (2/6) ..	0 4	0 4B	—	0 4B	0 4B
Klerksdorp Props.	2 3B	2 3B	2 4B	2 6	2 6s
Knight Central	11 9B	11 9	10 9	10 9B	10 3B
Knights Deep	—	—	—	—	42 0B
Lace Props.	3 9s	3 6B	—	3 6B	—
Luipaarsvlei Est.	9 0B	9 3B	9 3	9 0B	9 6s
Lydenburg Gold Farms ..	3 9B	3 6	3 7	3 7B	3 7B
Main Reef Wests	10 6	10 6	10 0*	10 0*	9 6B
Meyer & Charltons	—	—	108 9a	—	—
Middlevlei Estates	—	—	1 0B	1 2B	1 1B
Modder B's	—	—	77 6	77 6B	77 0
Modder Deeps	35 6B	36 0B	35 6	35 6B	35 3B
Natal Navigation Colliery	15 0B	—	15 0	—	—
New Boksburgs	1 0s	—	—	—	1 0B
New Era Cons. (5/-) ..	7 9B	7 11B	7 9B	7 9B	—
New Geduld Deeps	2 7B	2 8B	2 9s	2 7	2 7B
New Heriots	—	—	—	67 6B	—
New Kleinfonteins	22 0B	22 0B	21 9	21 9B	21 6B
New Rietfonteins	5 3B	5 0B	5 6	—	—
New Unifieds	16 0s	16 0s	—	16 0s	—
Nigels	—	20 0B	—	—	—
O.F.S. & Trans. Diam. ..	1 11B	2 1B	2 0	1 10B	2 0s
Pickstone Golds	—	—	—	40 0B	—
Pretoria Cement Co. ..	55 0s	55 6s	—	—	—
Princess	6 6B	6 6B	—	5 0B	—
Rand Collieries	6 6s	6 3s	—	6 0s	5 0s
Rand Klips	1 9B	1 6B	—	1 7	1 6B
Rand Nucleus	2 6B	2 6B	—	2 6	2 6B
Randfontein Deeps	5 0s	5 0s	5 0s	—	4 0B
Randfontein Estates ..	26 6†	28 0	—	27 3a	26 3
Robinson Deeps	40 0s	40 0s	40 0s	37 6B	35 6
Rooiberg Minerals	38 6	38 6	37 0B	37 3B	37 7
Ryan Nigels	—	—	—	3 6B	3 6B
Shebas..	5 3B	—	—	5 0B	—
Simmer Deeps	3 9B	3 0B	—	3 9s	3 9s
S.A. Breweries	40 6B	41 0B	41 0B	41 0B	40 6B
S.A. Lands	3 9B	3 9B	—	3 9B	3 9B
Springs Mines	19 0	19 0	19 0	19 0B	18 9B
Sub-Nigels	13 6	13 6B	13 9	13 9	13 0B
Swaziland Tins	—	51 6B	50 0B	50 0B	50 0B
Trans. Coal Trusts	48 0s	47 0B	47 6	47 9	47 3B
Trans. Cons. Lands ..	—	27 6B	—	26 6B	25 0B
Trans. G.M. Estates ..	53 0s	51 0	50 6	51 0	51 0B
Tudors	2 0s	—	—	—	—
Van Ryn Deeps	31 0	31 9	30 6	30 6	30 3
Village Deeps	42 3s	41 9	42 0	42 9	42 0B
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Engineering Notes and News.

THE ELECTRIC SMELTING OF TIN.

A Review of Present Electrical Processes of Reduction.

[BY A SPECIAL CORRESPONDENT.]

ALTHOUGH various articles have been published within the last three years in connection with this subject, very little has transpired of a definite and explicit nature which would be of much use as a guide to a mine manager contemplating the smelting of his own ore. As a matter of fact, there is an extraordinary dearth of information concerning the metallurgy of this element generally, and the only standard text-books dealing with the smelting of this metal confine themselves entirely to its reduction in blast or reverberatory furnaces, the subject of the electrical reduction of tin ore being absolutely ignored. It is a curious fact that outside the circle of those directly interested, very little is definitely known concerning the present processes of reduction, and Professor Louis has commented upon this in the preface to his book, "The Metallurgy of Tin," recently published. Tin smelting in the reverberatory furnace has been carried out in Cornwall since time immemorial, and the metallurgy of that process, in a broad sense, is very simple, though to make it an efficient one requires a good knowledge of minor technical details and long practice. Broadly speaking, the method may be described as follows: The tin ore, chiefly consisting of stannic oxide, SnO2, as mined in Cornwall, is dressed in streams or on tables in the mines, so as to contain about 63 per cent. to 64 per cent. of tin. The ore is delivered in bags of about 3 cwt., each in the form of a dense red-brown moist powder, fairly finely ground, say about 15 to 20 mesh. After being allowed to dry for some little time (depending upon the moisture contained, which may vary from 7 to 15 per cent.) the ore is mixed with the reducing agent—a low grade anthracite called "culm"—which contains a considerable quantity of slatey clay or aluminium-magnesium silicate, etc. The quantity of culm to be used depends, to a certain extent, upon the character of the ore. It is unusual to use one kind of ore only; indeed the proper blending of different ores is one of the principal factors in producing an efficient melt. Bolivian or Straits ore is very often mixed with the Cornish ore. Generally about 20 per cent. to 25 per cent. of culm is used; for the first charges no other flux is added. One furnace is generally built so as to take a charge of three to four tons of ore and about three-quarters of a ton of culm; a portion of the culm acting as fuel. A mixture of the ores is previously mixed with culm in varying proportions and smelting in a test crucible, so as to afford definite data. It is very essential to conduct the smelt so that the temperature is raised gradually, especially if the ore is of a silicious nature, because if the temperature rise is too brisk, tin silicate and silicides will be formed, which will go into the slag directly, causing a great loss. Also volatilization must be guarded against, as the metal is comparatively strongly volatile. In more modern plants a condensing chamber is used to recover the losses. The charge is frequently rabbled with iron rakes so as to ensure an equal distribution of the heat. In some plants a quantity of scrap iron is added to the charge before the melt is finished, in order to cause impurities to be taken up by the slag rich in iron which is being formed. The melt is finished after six or eight hours, when the tap-hole is opened and the metal and slag are run off together into a hemispherical cast-iron pan, which if ten provided with special heating arrangements. Each pan will hold from four to five tons of metal. The slag floats on the surface of the metal, and is run off into iron boxes to solidify. This first slag is generally rather rich in tin; it may sometimes contain 14 per cent. to 16 per cent. of tin in various combinations. It is, therefore, frequently used as an admixture to a subsequent smelt, or may be treated separately for tin. The final slag is said to contain about 6 per cent. to 7 per cent. of tin, and is, therefore, sometimes smelted together with lead refuse for solder tin. In more modern plants, however, the slag contains only 2·5 per cent. to 3 per cent. of tin. The crude tin, as first obtained, is cast into large ingots, still containing a considerable quantity of impurities. These ingots are placed on the sole of the reverberatory furnace and remelted at a comparatively low temperature, this being the so-called liquation process. The pure tin is thereby run off and the impurities remain behind, forming "hardhead"—consisting chiefly of an alloy of tin with sulphides and arsenides of iron. The percentage of tin varies somewhat, but is always considerable, and this "hardhead" always causes the smelter considerable trouble. One of the objects of electric smelting was to eliminate, if possible, the formation of this undesirable material, which is difficult to treat separately. After the tin has been liquated, it is collected in a large pan, or refining pot, heated from underneath. This tin is usually about 96 per cent. to 98 per cent. pure, and still contains impurities of arsenic, tin-suboxides, etc. For further purification so-called "tossing" and "boiling" are employed. The former consists in scooping the hot metal in thin broad streams through the air, whereby the impurities are oxidized and float on the top. The "boiling," which is more common, consists in immersing a raw piece of wood of large dimensions in the metal, and vigorously stirring the same. (Formerly it was believed that only wood from apple trees would serve the purpose properly.) A violent agitation sets in, oxidizing the impurities. In modern plants dry steam and air are blown through the metal for the same purpose. A small sample is ladled out from time to time and poured into the groove of the "test stone," a porous white sandstone; the behaviour of the solidifying metal, together with the fracture of the notched bar and the special sound of the "tin-crying" tells the skilled smelter of the purity of his metal. Indeed, this test is so marked that an experienced smelter can tell within 0·2 per cent. of the purity of the tin. Refined tin should have 99·6 per cent. to 99·8 per cent. of tin. The refined tin is usually cast into 28 lb. ingots and branded with the trade-mark, or else into strips of 18 in. and about ½ in. thick.

ELECTRIC TIN SMELTING.

At first glance it would appear that the electric furnace would not adapt itself very well to the smelting of tin ore, since the temperature of the electric furnace would seem to be unnecessarily high for the reduction. This assumption is quite erroneous, however. The reduction of stannous oxide by carbon required a comparatively high temperature, especially if a good separation from impurities is to be effected. Further, tin is readily volatile at a high temperature, and in a reverberatory furnace, with its wide hearth communicating directly with the smoke stack, or in the blast furnace where air is forced through the charge, this volatilized metal is mostly lost altogether if complicated condensing devices are not provided for. All this is avoided with the electrical furnace, if properly designed. Another feature is that the objectionable formation of "hardhead" can be greatly reduced, if the process is carefully conducted, as will be seen later. Finally, if the cost of power is not too high, a decided economy, compared with the reverberatory furnace, is quite possible, as the experiments made in bulk have shown. As to the losses of tin in slag, it has been conclusively shown that one can so conduct the operation that slags containing only 0·25 per cent. of tin may be produced in one melt; but it appears to be more economical to conduct the process that a richer slag, containing, say, 14 per cent. to 16 per cent. of tin, is first produced, and to treat this richer slag while still hot in a second furnace, as in this case the output is very much increased.

THEORETICAL YIELD.

If tin oxide, SnO_2 is reduced by means of carbon, we may assume that ideal equation 1 is:

$$SnO + C = Sn + CO_2.$$

but that part of the reaction takes place according to the equation:

$$SnO_2 + 2C = Sn + 2CO.$$

This is substantiated by the fact that a considerable quantity of CO can be seen burning at the mouth of the furnace; a certain amount of the CO will naturally serve as a reducer when passing through the charge piled up in the shaft, and for reasons well known it is of importance to conduct the smelt so that reaction (2) is predominant, though it will hardly be possible to realise this in practice to a greater extent than 50 per cent. Also the packing of the charge in the shaft, owing to the heaviness and fineness of the ore, will prevent this to a certain extent. We may therefore presume that under proper conditions, and after some hours' run, the reaction goes on according to 50 per cent. each of the equations 1 and 2.

THE HEAT ENERGY REQUIRED.

According to Thomson and other investigators, 118 grams of tin (one gram-molecule) will yield 145.300 gram calories by combustion into tin oxide. This amount of energy will, therefore, be required for the liberating of 118 grams of metallic tin. On the other hand, the combustion of 12 grams carbon into CO_2.

$$C + 2O = CO_2.$$

will yield 96,960 gram calories, and the combustion of 24 grams of carbon into 2CO:

$$2(CO) = 2CO$$

will give (in round figures) 58,000 gram calories. Assuming, therefore, that the reaction takes place according to equation (1) or $SnO_2 + C = Sn + CO_2$, we can calculate the energy requirements of the reaction per ton of metallic tin as follows: 145,300, 96,960, 48,340 kg. calories per 118 grams of tin, or 409.661 kg. calories per kilogram of tin, and as one kw hour 864 kg. calories we have for one ton of tin:

$$\frac{409{,}661 \cdot 1000}{864} = 474 \text{ kw hours per ton of tin.}$$

In the same way we find that, if the reduction takes place according to equation (2) or $SnO_2 + 2C = Sn + 2CO$, 855 kw-hours per ton of tin are required. Assuming that the reaction takes place to the extent of 50 per cent. of either of the reactions (1) or (2), around 665 kilowatt hours per ton of tin required. In addition to this, a certain amount of energy is required for the heating up of the charge to the temperature of reaction. No actual measurements of the temperature in the furnace were taken; but, judging from the appearance of the slag and the metal tapped, it may be safe to assume that the main average of the temperature of the whole interior of the reactive zone was about 1400°C. to 1600°C. Assuming that the ore contains 90 per cent. of tin oxide, we require 1280 kg. of ore for each ton of tin. Experience has shown that about 16 per cent. to 20 per cent. of slag per ton of ore is an average, or about 220 kg. of slag per ton of tin. The melting of 1 kg. of slag requires, on an average, 500,000 gram calories, 0·6 kw hour, or around 130 kw-hours for each ton of tin. The heat capacity of the charge and the molten tin we may set down at 65 kw hours as being on the safe side. The radiation losses through the furnace walls, electrodes and water jackets are naturally of such a nature that no accurate figures [illegible] be equal to that consumed by the slag or 130 kw hours. The escaping gases in the furnace used in the experiments left the furnace mouth at a temperature of about 800°C.; the losses through this source may therefore be set at about 150 kw hours for each ton of tin. In summing up these items we therefore find that in practice it [illegible] to produce one ton of tin with an expenditure of power equal to: For the reaction, 665 kw hours, for the slag, 130 kw hours, for the specific heat, 65 kw hours, for the radiation losses, 130 kw hours, for losses through gases, 150 kw hours.

Borchers has also attacked the problem of the electric smelting of tin ores, and the extract given herewith shows that he was apparently investigating this question about the same time as Harden commenced his work on the large scale. Borchers' results were fully borne out by Harden, as will be subsequently seen, though there is no question but that both these authorities were, at the time, working quite independently of each other. "The smelting of tin in an electric furnace has been carefully studied by Mattonet, in the author's (Borchers') laboratory. In experiments performed with impure ores the sulphur in the ore passed to a considerable extent into the crude tin, which contained up to 2·7 per cent. S. The yield of Sn under these conditions was also unsatisfactory. Better results were obtained with roasted ores and an approximately neutral slag, in which, however, by adding some soda to the charge the melting point was lowered somewhat and Na_2O made a part of the basic constituents. Since at most only 450 lbs. of Na_2CO_3 (cost $2·50) are needed for a ton of Sn, the cost of working is not increased, because more than enough Sn is prevented from going into the slag to compensate. The slag obtained was perfectly free from Sn globules (in the case of other methods of smelting it is permeated by pellets of Sn), and contains only from 1 to 1·5 per cent. of slagged Sn, as compared with from 2 to 5 per cent. by other processes. Direct heating by resistance is applicable for this method of smelting on account of the relatively good conductivity of the charge and of the slag. In this way, the proper temperature for the reduction of the Sn is maintained and is not much exceeded in the bath. Since, moreover, the blast, which in one method tends to prevent the flowing together of the Sn globules, is absent and an acid lining of the hearth, which causes losses by slagging and by volatilization, is unnecessary, the direct yield of Sn is so good that, whereas it is absolutely necessary to recover Sn from the slag in smelting by the blast furnace or by the reverberatory furnace, in the case of electric smelting this subsequent treatment of the slag can be dispensed with altogether or limited at the most to one smelting."

(To be continued.)

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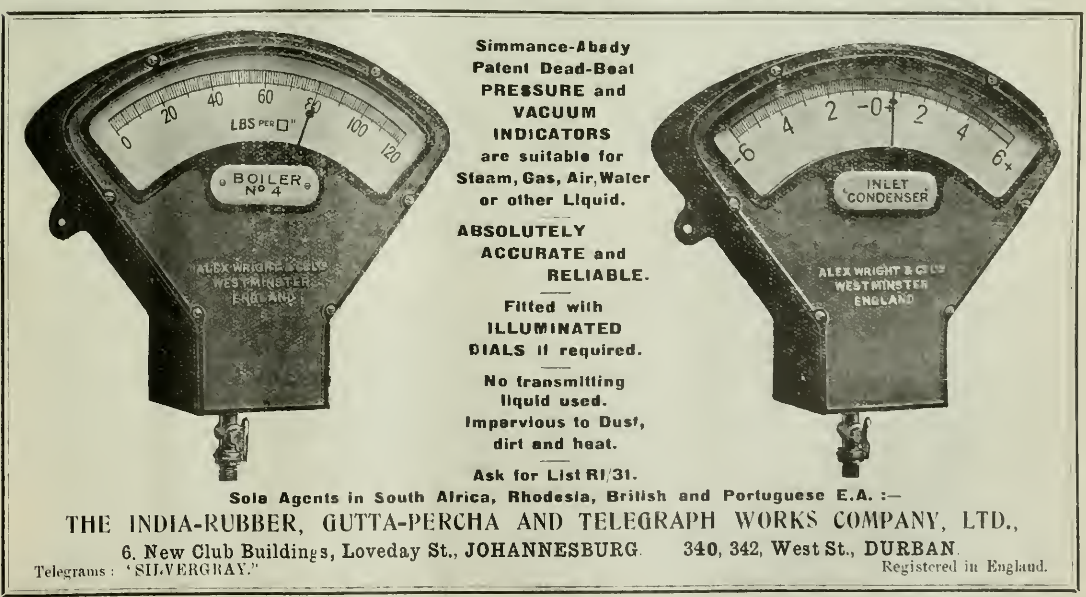

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PROGRESS OF NATAL INDUSTRIES.—II.

Exhaustive Review of Many Promising Activities—Coal, Tea and Whaling.

Soap.—With regard to the raw materials required for the soap-making industry, in consequence of the drought towards the end of 1912 there was a considerable falling off in South African supplies of tallow, which is to be regretted, as there is ample scope for rapid development of the production of tallow to meet the demand of South African soap and candle makers. The quantity of ground nuts grown in Natal and in the low veld of the Transvaal is still practically only sufficient to meet the demands of the natives as an article of food, although a certain proportion of ground nuts is crushed in Durban, from which an edible oil is manufactured. There is, however, considerable scope for the development of the cultivation of ground nuts to meet South African requirements in the various directions, viz., as a food for the natives, for the manufacture of an edible oil, and for use in the manufacture of soaps. With regard to soya beans, there has been practically none offered. Whilst the experiments at Cedara and other Government farms in 1910 proved these beans to be eminently suitable for growth in this country, the experiments made by farmers were not so successful, the yields being somewhat low; but it is thought that if the farmers had continued to cultivate the seed for three successive seasons, until the soya bean had been acclimatised, they would have found the soya bean an excellent rotative with maize and a remunerative crop. Cotton seed oil is another oil suitable for soap-makers, and if the cultivation of cotton develops in South Africa there will be ample outlet for the seed in this country.

Butter.—Since the breaking of the drought the factories have been fairly busy. But it is an accepted axiom amongst stock owners that when once a cow is checked in the normal flow of her milk she never properly recovers ground during that particular milking season; and the probability is that, in spite of the increase in the number of milch stock in the country, the present season's output will not show any advance over that of 1912. But with good seasons to aid it the dairying industry will forge ahead in a marked degree.

Milling.—The inland Provinces were fortunate in securing a crop of wheat which in quantity and quality was a record yield. Millers complain of being severely handicapped on account of the Australian millers dumping their surplus flour on the South African market, so that the working margin between cost of wheat and selling price of flour becomes so small as to make profitable working at times entirely inadequate to the very heavy outlay in capital, buildings, and machinery. It is stated that on account of dumping, Australian flour can be bought freight paid to South African ports, in bond, at the same price, and sometimes at a less price, than Australians pay for their flour. It is satisfactory, however, to record that consumers recognise in South African milled flour a superior article to the imported. In maize grinding, millers have experienced rather a bad year owing to the abnormal rise in cost of mealies, following on the long drought. Such a rise it was impossible to foresee, and as a result millers were only able to buy from hand to mouth, and sometimes had to stop the mills altogether on account of scarcity of supplies. For the second time South Africa sees itself in the ludicrous situation of having over-exported her maize crop, paying fabulous prices to bring it back again. Here again is seen the necessity for the preparation of reliable Government statistics. The principal mill engaged in the industry in Natal is manufacturing from maize not only meal, but a variety of breakfast foods and puddings; and it is surprising to learn what a large number of preparations can be made from the humble mealie. Whilst the favour with which the various maize products referred to are received in South Africa is increasing, the conservative tendency to cling to the imported article is to be regretted. A perusal of the statistics of importation shows conclusively that the people of South Africa are not yet fully alive to the excellence of the local products, which are not so well advertised as those imported, but which have an advantage in freshness and cheapness.

Fertilisers.—The natural development of agriculture in recent years has largely increased the demand for fertilisers, and the large reductions which were made in October, 1911, in railage rates on long distance traffic have stimulated the demand from the remote parts of the Union. During the year the phosphate deposits at Weenen were examined by the chemist to the Government Agricultural Department, but unfortunately his report only confirmed that made by a local fertiliser company some years ago, that the phosphate was not suitable for the manufacture of superphosphates. Until phosphates of good quality are discovered in the country, South Africa must rely very largely on imported fertilisers to supply the requirements of phosphates. The local whaling industry, whose by-products provide valuable raw materials for fertiliser manufacture, did not have so good a season as in 1911, but the supply of bone material was so much larger that there was practically no bone meal imported from India. The reduced railway rates for the carriage of fertilisers has widened the area from which bones can be collected and has made possible the centralised manufacture of bone products in a few centres; and it is only in this way that the comparatively small quantity of these materials which is available in this country can be economically and efficiently treated. The guano from the Guano Islands at the Cape is held as a Government monopoly, and is sold by the Government direct to farmers at much below what is believed to be its market value of their productions. Reputable dealers in fertilisers are handicapped by the Government's delay in passing an Act for the Union to control the sale of fertilisers, such as was in force in the Cape Colony, and is on the statute book of nearly every agricultural country. The Government's co-operative expert and the institution of associations for the co-operative purchase of farming requisites and the marketing of farm products have done something to teach the South African farmer the advantage of buying on a cash basis, though much remains to be done in this direction. The Durban factories have had a good share of the South African trade in fertilisers, though they are in a position to cater for much more. One of the factories especially is equipped with the most up-to-date machinery, and has a staff of expert chemists on the premises. Whilst no figures of the output are obtainable, it is thought that the output from the Durban factories is as much as, if not more than, that of all the other fertiliser factories in South Africa.

Explosives.—The climate of Natal generally might, on account of the heat, be considered unsuitable for the manufacture of explosives, and indeed this objection is one which at first sight would seem an insuperable one to the explosives manufacturer. But as far as temperatures go, Durban has smaller seasonal variations than almost any place in the sub-continent, and the daily summer maxima are lower than those of other places of which there are records available. The paradox that the Durban district has the reputation of being one of the hottest in South African in the summer, whereas the fact is that the day temperatures are lower than the maximum temperatures of other districts, is explained by the effect of humidity in the air at Durban. When the sensations of the human body are used as a thermometer it is almost impossible to differentiate between temperature and humidity; but as far as explosives are concerned the temperature is the controlling factor, and the Durban climate is actually a very suitable one for their manufacture owing chiefly to the equability of the temperature through the year with unexpectedly low maximum temperatures. Since the Union of South Africa was established there has been a decided tendency for the Railway Administration to level up various districts by giving reduced railway rates from and to those districts, in order to try and place manufacturers as much as possible on equal terms. Such an arrangement is perhaps a natural one in a new administration, but, of course, the effect in the long run will be to raise the prices of manufactured goods to the consumer, as it stands to reason that, if the manufacturer at the most suitable site is to be penalised in order to place him on a level with the manufacturer at an unsuitable one, he cannot develop his output to get the greatest economy of working, and as a result the price of the South African-made goods cannot be reduced to compete with the Oversea goods without a considerable duty, which again raises the price to the consumer. It is, therefore, to the interest of consumers in all districts that manufacturing should be allowed to develop along natural economic lines, and that political influence should not be allowed to give undue preference to districts which in a natural order of things are not suitable, and which without special treatment would not develop. The policy of the Railway Administration here referred to had an adverse influence on the explosives industry at Umbogintwini. The demand for explosives in South Africa is, of course, enormous, and is chiefly for gold-mining, although the diamond mines consume a quantity of explosives, which in another country would be considered great. This demand is one which has been steadily growing, and it has increased from 587,000 cases in 1908, to 896,000 cases in 1912, and the consumption of the present year will certainly, at the present rate of progression, easily top that of last year. As illustrating the magnitude of this consumption, comparison can be made with the explosives used in building the Panama Canal. From available figures, it appears that the value of explosives which will be used on this huge undertaking from the time the United States took over the work until it is finished, will not be as great as the value of explosives used in South Africa in one year. Again, the consumption in South Africa annually exceeds that of Great Britain, including black powder, which is very largely used here. Three factories in the Transvaal, Cape Province, and Natal supply the whole, and at a price delivered to the Rand which is 16 per cent. lower than the price of the supply to the largest consumers in Free Trade England. Such a fact is a criticism on the statement so often made by the Free Trader that the consumer always pays the duty.

(*To be continued.*)

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Automobile Notes.

Under the Motor Cars (Use and Construction) Order, 1904, a motor car in England is prohibited on any highway unless it is fitted with two independent brakes of such efficiency that the application of either shall have the same effect in stopping the motor car as if the wheels were prevented from revolving. In a case decided by the King's Bench, the Court held that the reversing of a petrol-driven motor car could not be regarded as one of the two independent brakes required by the above provision. Doubts have in consequence arisen as to whether a steam-propelled motor car, the engine of which is capable of being reversed and used as a brake, can legally be used on the highway when only one brake is fitted. The Local Government Board have caused investigations to be made in the matter, and have come to the conclusion that an amendment is permissible. An order has accordingly been issued which provides that the reversing gear of a steam motor car may be regarded as one of the necessary brakes, but the proviso is only applicable to motor cars exceeding two tons in weight unladen, and not used either as stage carriages, or otherwise, for the conveyance of passengers for gain or hire.

* * * *

At a recent meeting of the Institute of Automobile Engineers last week, a paper was read on the subject of "Heavy Motor Vehicles," in which the authors, Messrs. George W. Watson and D. S. Kennedy, touched on the future development of the two sources of motor power—steam and petrol. After several years' experience of both type of engine, they found no reason to favour the latter in preference to steam, except in special cases. There could be little question that steam still held the field in regard to simplicity. It was with regard to reliability that the petrol enthusiasts raised the challenge. Whereas a steamer could continue to give out its full power long after it had developed a mechanical defect, a petrol machine was dependent for its full power on the mechanism being in perfect order. The slightest defect would at once cause a fall in efficiency, which no extra expenditure of fuel would make good. A petrol machine only worked economically at about seven-eighths full load. The question became one of either using a large engine to work uneconomically, or a small engine with an undesirable multiplication of gears. A steamer would continue to perform its daily work with wonderful regularity, and its defects grew gradually, nor did they require the same urgent attention as in the case of the petrol machine. This was a very great point to owners. The authors considered that to obtain the best results, with whatever type of vehicle was used, better arrangements should be made for the comfort of the drivers, so that they could work for long periods without experiencing undue fatigue.

* * * *

Col. the Rt. Hon. J. B. Seely, Minister of State for War, has become a vice-president of the Imperial Motor Transport Conference. This, taken in conjunction with the fact that the Army Council have nominated three representatives to the Executive Committee of the Conference, seems to indicate that the War Department regard the rapid development of an adequate system of mechanical transport as of the utmost importance in relation to the defence of the Empire. Col. the Hon. J. Allan, Minister of Defence for New Zealand, during his stay in England, has nominated

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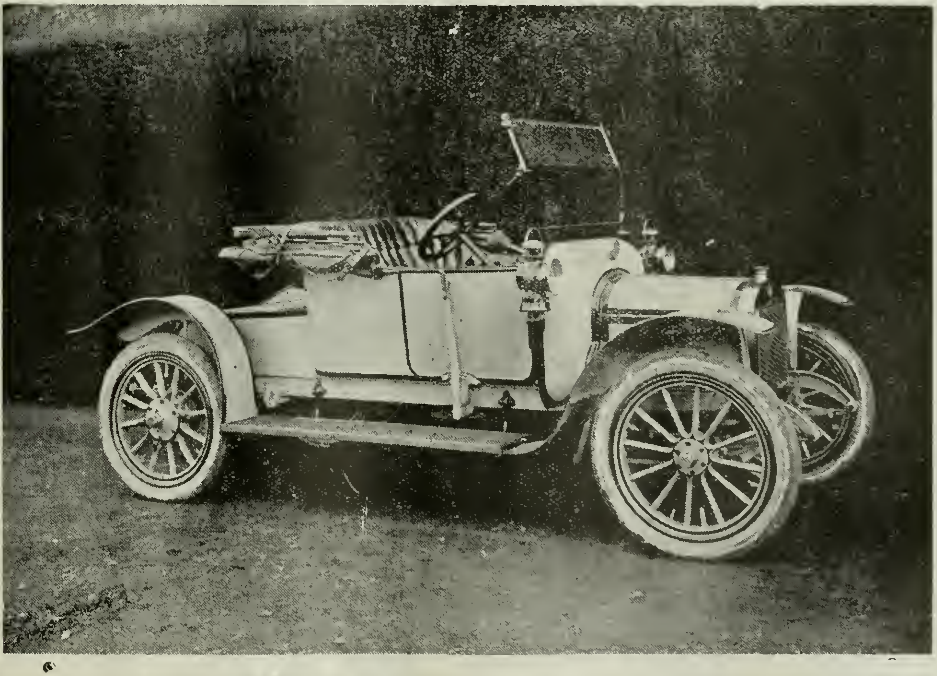

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a delegate to represent his Department, and invitations in connection with this section of the work of the Conference have been sent to the other self governing Dominions, and also to India and Egypt. Examples of types of industrial motor chassis, already accepted by the War Department in connection with their scheme of subsidy, will be conveniently available for the inspection of delegates among the exhibits at the Commercial Exhibition at Olympia, which will be open from July 18 to July 26. There will thus be every opportunity of ascertaining, both by discussion and by examination, how far these models lend themselves to either mitiltary or civil use in the Empire overseas.

* * * *

On Thursday the committee of the Transvaal Automobile Club issued the official results of the petrol consumption tests that were concluded last Saturday and Sunday in a run from Johannesburg to Potchefstroom and back. Out of seven places no fewer than four were taken by Talbot cars. The events were an open event for the Park Trophy and Schlesinger Cup competition, which was limited to private drivers, while a special section was included for American cars. What is regarded as the professional contest—that for the Park Trophy—was, somewhat to the surprise of many, annexed by a private driver in the person of Mr. J. O. Lucas, with a Talbot car, who also took second place among the amateurs. Mr. C. Hoare was second. In this section, Mr. D. H. Saker, who has a previous win to his credit, was placed third, also with a Talbot car. In the Schlesinger Cup competition, Mr. B. R. Penny steered a Ford to victory, and second honours for the lightweight car against many serious rivals with 4,528 points, while Mr. J. O. Lucas, the winner of the open event, was second with 1,048 points. In this class, in comparing the points it should be remembered that only the weight of the passengers and their baggage was taken into account. With a similar aggregate of points, Mr. C. H. Williams, with a Talbot, was placed third, In the American section, Mr. Simmond, with a Buick car, came out best. The following are the results:—Park Cup: 1, J. O. Lucas, Talbot, 17,327 points; 2, C. Hoare, Crosseley, 15,848 points (on Johannesburg weight); 3, D. Saker, Talbot, 15,183 points. Schlesinger Cup: 1, Mr. B. R. Penny, Ford, 1,528 points; 2, Mr. J. O. Lucas, Talbot, 1,048 points; 3, Mr. C. H. Williams, Talbot, 1,018 points. American Section: 1, Mr. Simmond,

* * * *

Seventeen motor lifeboats are now fully equipped on the north-east coast, and five others are almost completed in the building yards.

At its last general committee meeting, the R.A.C. had under consideration an invitation from the Executive Committee of the Imperial Motor Transport Conference to the chairman, or failing him, a representative of the Club, to attend the session of the Conference in London in July next. It was unanimously decided to ask Mr. Sidney Benjamin, who is now on a visit to England, to attend as the representative of the Royal Automobile Club of South Africa.

* * * *

At the conclusion of the motor boat racing at Monaco, Dr. Morton Smart, commodore of the British Motor Boat Club, was decorated by the Prince of Monaco with the cross of a chevalier of the Order of St. Charles.

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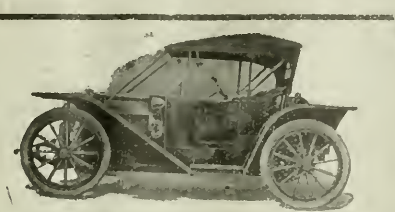
LONDON. —— HANOVER.

On a Saturday afternoon a youth driving a two-seater Ford in the neighbourhood of Rhodes' cottage at Muizenberg, was observed to have both his feet resting on the top of the folded glass wind screen. As an instance of foolish bravado this would be difficult to match, and it is to be hoped that his parents will come to a knowledge of his performance and administer the whipping he deserves. It is a pity he was not observed by the police, as it should not be difficult in the circumstances to establish a case of reckless driving.

* * * *

Mr. E. Mackay Edgar's Maple Leaf IV., last year's winner of the British International Trophy, is now being prepared for the coming contest in August next. The engines are undergoing a thorough overhaul at East Cowes.



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Companies in Liquidation.

Motale Copper Developing Syndicate, Ltd. (voluntary), April 22nd. meeting, Simmonds Street, Johannesburg, on May 13th. Alex. Aiken, liquidator.

Rand Delagoa Bay Landing Co., Ltd.; a general meeting will be held at 22 and 23, African Banking Corporation Chambers, Johannesburg, on May 8th. Thomas Douglas Arthur George Coll and Walter Launcelot Turpin, liquidators.

Roodepoort Central Deep, Ltd.; a special general meeting will be held in the board room, [illegible] Buildings, Main Street, Johannesburg, on June 17th.

Nicholas, S. J. & Co., Ltd.; a general meeting will be held at 9, New Club Buildings, Main Street, Johannesburg, on May 30th. E. van den Berg and G. Duval Ward, joint liquidators.

Beadon Prospecting Syndicate, Ltd. The; a general meeting will be held at 22, Exploration Buildings, Johannesburg, on May 16th.

Van Ryn Deep.

Shafts: The west incline shaft was sunk 139 feet to a total depth of 2,927 feet, and then stopped for the time being. The engine chambers for the electric hoists at the east and west inclines have been cut, and the foundations of the hoist at the west incline completed. Development: The development in the eastern and central sections of the mine has opened up ground of very satisfactory value, and encouraging values have also been obtained in the lower portion of the western section. The total footage driven, risen and sunk, exclusive of shaft sinking, amounted to 5,269 feet, of which 3,092 feet were sampled, giving an average of 21·1 dwts. over 27 inches. Of the footage sampled, 2,571 feet were payable and of an average value of 26·5 dwts. over 25 inches, and 521 feet unpayable at 2·3 dwts. over 36 inches. The payable ore reserves were increased by 208,341 stoping tons of a value of 10·3 dwts., bringing the total payable reserves to 1,486,334 tons of an average value of 7·6 dwts. Assuming 15 per cent sorting, this would bring the milling tonnage to 1,263,392 tons of an assay value of 8·9 dwts. The unpayable reserves at March 31 amounted to 574,576 tons, having an assay value of 2·9 dwts. A start was made during the quarter with the opening up of stope faces. The expenditure on the mine during the quarter amounted to £134,189 1s. 4d.

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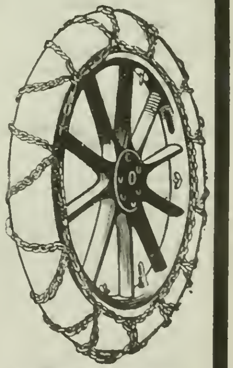

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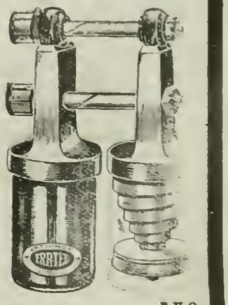

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New Patents.

92. John Godfrey Parry Thomas.—Improvements in and connected with the control of the transmission of power between shafts with variable velocity ratios.
93. Alfred Jacob Schuler.—A process for making dull enamel.
94. John Goldstein.—A method of facilitating aseptic shaving and apparatus therefor.
95. David Leech.—Combination hooks and buckle for breast collar harness.
96. (1) Magnus Manson, (2) Nicholas Johannes Swanepoel, (3) James Henry Dorrey.—An appliance or attachment for rendering skips, lifts, and similar structures safe.
97. William Carson.—Improvements in amalgamating machines.
98. (1) John Hudson Hughes, (2) Eneas George Hayward.—An improved instrument for measuring and indicating the length of the diameter and for cylindrical bodies or other bodies of similar shape.
99. James Book.—An automatic lightning protector.
100. Aron Katz.—Improvements in and relating to selecting devices for telephone systems.
101. (1) Alfred Whitby, (2) Josiah Whitby.—Improved poles for use in mines.
102. Alexander Albert Holle.—Improvements in and relating to aeroplanes.
103. Ernst Sokolowski.—Improvements in or relating to explosives.
104. Frederick Ehninger Baldwin.—Improvements in acetylene gas lamps.
105. Frederick Ehninger Baldwin.—Improvements in miners' lamps.
106. John Ashford.—Improvements in and relating to tube wells and the like.
107. (1) Edward Henry Johnson, (2) George James Mackay, (3) Charles Frederick Edward Oscar Schmitt.—Improvements in filtering apparatus.
108. Johannes Jacobus van Zyl.—An improved automatic coupling, with specially constructed link for railway carriages and trucks.
109. (1) Ludovic Colquhoun, (2) Thomas Donaldson, (3) The British South African Explosives Co., Ltd.—Improvements in explosive compositions.
110. Andrew Danks.—An improvement in stamp heads and mortar boxes for use in stamp mills crushing metalliferous ores and the like.
111. (1) John Hawthorne Wilson, (2) Robert Craib.—Improvements in sand pumps.
112. (1) Ludovic Colquhoun, (2) Thomas Donaldson, (3) The British South African Explosives Co., Ltd.—Improvements in explosives.
113. Frederick Haisman.—Improvements in spraying devices.
114. Gustaf Andersson.—Improvements in rock drilling machines.
115. Baron Cohen.—Improvements in tobacco pipes.
116. Giacomo Durio.—Improved method for the tanning of hides and skins.
117. Whitman Symmes.—Improvements in agitating and mixing apparatus for liquid slimes.
118. Daniel Corlett.—An improved anchor bolt.
119. (1) Daniel Corlett, (2) Thomas Harrison.—An improved rope clip.
120. Edward Thompson Morriss.—Improvements relating to perambulators, mail-carts and the like.
121. Henry William Rogers.—Improvements on safety catch for cages, skips and lifts.
122. Fabian Mercer Cox.—Apparatus for concentrating diamond bearing material.
123. Johannes Jacobus Van Zyl.—An improved automatic device for coupling rolling stock, and which has no loose links or buffer pins.
124 Johannes Jacobus Van Zyl.—An improved automatic coupling device for fixing on to the present buffers of rolling stock.
125. Edgar Arthur Ashcroft.—Improvements in, and apparatus for, the electrolytic manufacture of light metals, caustic alkalies in pure anhydrous condition, and alloys of light metals with heavier metals or the continuous treatment of such alloys for obtaining final products.
126. Sydney Noel Perfect.—Improvements in or relating to the handles of shovels, spades, digging forks and the like.
127. James William Lee and John Snowball, jun.—Rock drill dust collector.
128. Harry Ormiston Ormiston.—Improved metallic alloy and process of manufacture thereof.
129 Alfred Whitby and Josiah Whitby.—Improved pack poles for mining purposes.
130. James Watson.—Improvements in and in connection with liquid controllers for electric motors.
131. Leslie Watt Winnall.—Improvements in devices for converting rotary motion into reciprocating motion.
132. Harry Alexander Stenning.—Improvements in and relating to steam superheaters.
133. Teofron Boberg.—Improvements in and relating to the carrying out of catalytic operations and more particularly to the conversion of unsaturated fatty acids and their glycerides into saturated bodies.
134. Lewis Lawrence Scott.—Improvements in internal combustion percussive machines.
135. William Joseph Holmes.—Improved pencil sharpening device.
136. James Bell.—Improvements relating to detachable bits for rock drills and the like.
137-8. John Thompson Steele.—Improvements in or relating to machines for making postal and other envelopes, paper bags and the like.

CITY DEEP, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS OF EXTRAORDINARY GENERAL MEETING.

NOTICE IS HEREBY GIVEN that an Extraordinary General Meeting of Shareholders in the abovenamed Company will be held in the Board Room, Second Floor, Corner House, Commissioner Street, Johannesburg, on TUESDAY, the 5th day of AUGUST, 1913, at three o'clock in the afternoon, for the purpose of considering the advisability of, and, if thought fit, passing a resolution sanctioning, adopting and confirming, in terms of the provisions of Clause 121 (5) of the Company's Articles of Association (with or without any modification thereof which may be agreed to between the parties thereto) a certain Provisional Agreement dated 3rd May, 1913, made between the Directors of the Company and the Directors of THE CITY & SUBURBAN GOLD MINING & ESTATE COMPANY, LIMITED, for the sale by this Company to THE CITY & SUBURBAN GOLD MINING AND ESTATE COMPANY, LIMITED, for the sum of £101,250 (*i.e.*, £6,750 per claim) of a certain portion of this Company's mining ground, in area equal to fifteen claims, adjoining the more southerly part of the south eastern boundary of the CITY & SUBURBAN COMPANY'S property, and consisting of a defined area of ten claims and an additional area of five claims the exact boundaries of which latter area are to be located hereafter, in the mnner described in the Agreement.

The principal provisions of the Agreement are :—

The purchase price is payable as to £25,000 one week after ratification of the Agreement by Shareholders of both Companies in general meeting, and as to the balance, in four equal annual instalments, with interest at 5 per cent. per annum, with liberty to the Purchaser to pay off the whole or any portion at any earlier time.

The Purchaser will have the right to take possession and commence work on paying the £25,000, being liable for all rates, taxes and licences. Transfer will be given of the ten-claim area when payment of £67,500 and all interest due has been made and the diagram thereof has been confirmed, and of the remaining areas equal to five claims, upon payment of the balance of the purchase price and all interest and on final determination of the areas and on confirmation of the diagrams thereof.

The Purchaser upon final determination of the boundaries of the aforesaid area of fifteen claims (in the manner described in the Agreement) is to have the right for one month to acquire an additional area equal to 2.7 claims, being an extension of the above fifteen-claim area, at the same price, *i.e.*, £6.750 per claim, payable on the terms set out in the Agreement.

The Agreement is conditional upon its confirmation by Resolution of the Shareholders in General Meeting of each Company.

A copy of the Agreement showing the situation of the ten-claim area and the approximate situation of the other areas making up five claims will lie for the inspection of Shareholders at the Head Office of the Company, Seventh Floor, The Corner House, Johannesburg, at the London Office, No. 1, London Wall Buildings, London, E.C., and also at the office of the Credit Mobilier Francais, 30-32, Rue Taitbout, Paris.

The following members of your Board are interested in the transaction, viz., Mr. H. Eckstein, as Chairman of the Local Board of The City and Suburban Gold Mining and Estate Company, Limited, and Messrs. R. W. Schumacher and W. H. Dawe, as shareholders of that Company, either personally or through their Principals.

The Transfer Books of the Company will be closed from the 5th to the 11th August, 1913, both days inclusive.

Holders of Share Warrants to Bearer who desire to be present or represented at the Meeting must deposit their Share Warrants (or may, at their option, produce same) at the places and within the times following :—

(a) At the Head Office of the Company, in Johannesburg, at least 24 hours before the time appointed for the holding of the meeting.
(b) At the London Office of the Company, 1, London Wall Buildings, London, E.C., at least 30 days before the date appointed for the holding of the Meeting.
(c) At the Credit Mobilier Francais, 30-32, Rue Taitbout, Paris, at least 30 days before the date appointed for the holding of the Meeting;

and must otherwise comply with the "Conditions as to the issue of Share Warrants or Bearer Shares" now in force.

Upon such production or deposit, a Certificate, with Proxy Form, will be issued, under which such Bearer Warrant holders may attend the Meeting either in person or by proxy.

By Order of the Board,

RAND MINES, LIMITED, Secretaries.
S. C. STEIL, Joint Secretary.

Head Office: The Corner House,
Johannesburg, Transvaal, 4th June, 1913.

66139

THE SOUTH AFRICAN
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WITH WHICH IS INCORPORATED
South African Mines, Commerce and Industries.
ESTABLISHED 1891.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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IMPORTANT NOTICE.

NOTICE IS HEREBY GIVEN THAT THE LONDON OFFICE OF THIS JOURNAL, IN SALISBURY HOUSE, HAS BEEN CLOSED. THE ENGLISH AGENCY OF THE PAPER HAS BEEN ENTRUSTED TO THE ARGUS PRINTING AND PUBLISHING COMPANY, LIMITED, BYRON HOUSE, 82-85, FLEET STREET, LONDON, E.C. OVERSEA ADVERTISERS AND SUBSCRIBERS ARE KINDLY REQUESTED TO PAY THEIR ACCOUNTS AND SUBSCRIPTIONS TO THE ARGUS COMPANY, WHO WILL GRANT RECEIPTS ON OUR BEHALF. PAYMENTS MADE TO ANY OTHER PERSON OR PERSONS WILL NOT BE RECOGNISED.

THE LOCAL OFFICES OF THE JOURNAL ARE NOW SITUATED AT 176-180, STOCK EXCHANGE BUILDINGS, FOX STREET (2nd FLOOR).

Notes and News.

Luipaardsvlei Estate. Good progress continues to be shown at the Luipaardsvlei Estate, and the returns for May, printed elsewhere in this issue, will be seen to be satisfactory. Two new tube mills are to be installed, and are expected to be working by January next, improving the extraction and proportionately increasing profits. Development is giving satisfactory results, and the mine is in a sound position.

* * * *

Frank Smith. Washing has actually started at the Frank Smith diamond mine, and within the next fortnight definite results should be known. It is understood that Mr. T. McLelland is more than satisfied with the initial behaviour of the plant, and high anticipations are held regarding the results.

* * * *

Piggs Peak. Latest accounts from the Piggs Peak mine speak well of developments in the old section of the property. An ambitious power scheme is under consideration, and the outlook for the property is steadily improving. The associated property of the same control, the Lisbon-Berlyn, is looking better under the charge of Mr. Sharpley. A recent report on the possibilities of the pyritic ore by Mr. J. R. Williams speaks very hopefully of solving this twenty-year-old problem of the mine.

* * * *

River Diggings. The returns of diamonds found and actually sold in the Bloemhof district for the month of May give a total of 9,587½ carats, value £57,717. This is an increase of about £15,000 on the previous month, and constitutes a big record. Many stones of over fifteen carats and a number of smaller finds are reported from the commonage. Good reports are also coming in from Avonstuur and London, where activity is increasing.

The Robinson-Crown Mines Deal.

Speaking at the annual meeting of the Crown Mines last week, the chairman, Mr. S. Evans, made the following interesting reference to the suggestion for the absorption of the Robinson mine by the Crown Mines Company. He said: " So far the idea has not gone beyond a preliminary discussion among a few of the larger shareholders in both companies. Your directors have not been approached on the subject and it has not been discussed at our board meetings. Generally, I should say that we should be prepared to view the proposal favourably, provided satisfactory terms could be agreed on. We recognise that in the case of a mine like the Robinson, a time must come long before it has exhausted all its ore reserves when it and the company absorbing it stand to gain by a fusion. That is one of the great lessons to be derived from what has taken place in the case of the Crown Mines: the shareholders in the Crown Deep and the shareholders in all the companies absorbed by the Crown Deep have benefited by the amalgamation. It is hardly necessary for me to state that you may rest assured that no proposal will be considered by your directors until our technical advisers have made a thorough examination of the Robinson mine and have satisfied themselves that its absorption would be advantageous to the Crown Mines."

* * * *

Modder " B " and Rose Deep.

Owing to a printer's error in our last issue, the headings of the extracts from the reports of the proceedings at the annual meetings of the Rose Deep and Modder " B " were transposed, and the mistake is rectified elsewhere in this issue by the insertion of those extracts under their respective headings. In the second line of the Rose Deep extract the text should read " largely due to *cleaner* mining," instead of cheaper mining, as printed in our last impression. The corrected version appears in this issue.

* * * *

Rising Prices for Diamonds.

The local market for diamond shares has received a considerable fillip from the news that the prices of even the lowest quality of stones continues to rise. It is understood that the contract price for German South-West African diamonds was forty-six marks (£2 6s.) per carat against an average price of twenty-nine marks last year. Thus the Diamond Regie will show additional profits of from £750,000 to £800,000. The German Government's interest in the profits will probably enable Damaraland to dispense with the Imperial contribution. It is stated that De Beers' offer was very little lower than the Antwerp group's, all of which goes to show the substantial nature of the improvement in the prices of stones.

* * * *

Tweefontein Colliery.

Many Transvaal collieries are doing better than ever to-day, and the Tweefontein report shows that the company has returned to its shareholders dividends aggregating 3s. per share, as compared with 2s. 6d. for 1911, and 1s. 6d. for 1910. At £26,486, the total profits for the year show the satisfactory improvement of approximately £2,000, and, after meeting the dividend disbursements, a balance of £9,980 remains to be carried forward to the current year's account. The quantity of coal sold during the year was substantially higher on the comparison, the figures for 1912 and 1911 being 308,231 tons, and 277,777 tons respectively.

* * * *

Work at " Knights."

At the Witwatersrand, or Knights, mine work in connection with the excavations and foundations for the new tube mill plant is well advanced. The equipment is due to arrive on the mine at an early date, and it is anticipated that these accessory fine grinding machines will be milling in the course of the next few months. Underground the development position remains satisfactory, especially in the deep level portion of the property. A start is being made on sinking the south incline in this section of the mine.

Tanganyika Concessions.

The report of " Tanks " for the year ended September 30th, 1912, states that notwithstanding the disturbed political and financial outlook and the consequent depression in the markets during the period under review, the directors have been able to meet all the company's commitments, including the debenture interest. The result of the year's operations has been a balance of £136,116 against profit and loss, which has been written off the premium on shares account. The Union Minière du Haut Katanga, which owns the copper mines and in which the Tanganyika is interested to the extent of 45 per cent., has now entered the profit-earning stage. Two furnaces are expected to be running about the end of June, and the directors believe that in the near future the Tanganyika will be able to rely on the Union Minière as a substantial dividend-payer. The Benguella railway has now been completed for 430 kilometres from Lobito Bay, and another section is being built which will carry the line to Bihe at 620 kilometres by the end of 1913, in accordance with the terms of the concession. The receipts on the working of the part of this railway now open show a profit over working expenses. The Rhodesia-Katanga Junction Railway for the year ending September 30th earned a balance of £40,840 over expenditure, and for the six months to end March, 1913, a balance of £26,623. The progress recorded this year may not seem rapid, but progress there is. The company has made a distinct advance in its great enterprise of linking up Lobito Bay with the copper belt, and seeing how much has been done we do not see why anyone should doubt of the ultimate success. The Zambesia Exploring Company also issues its report and accounts to the same date as the Tanganyika Concessions, with which its fortunes are now closely connected. Beyond the continued progress of the railways and copper mines, both the Tanganyika and Zambesia Exploring Companies are interesting themselves in the testing of the diamond deposits on the Kundelungu plateau. Rumours concerning these deposits circulate from time to time, but the directors are not saying much at present.

* * * *

The Pomona's Year.

The report of the Diamond Company Pomona for 1912 states that recent prospecting work has given satisfactory results, " which, however, are not sufficient to allow of conclusions being drawn as to the probable life of the mine." The company has, in conjunction with the Deutsche Diamanten-Gesellschaft, made out a plan for joint construction and exploitation of an economically worked railway, the costs of construction for each company being estimated at 1,200,000 marks. The board of adminstration of the Pomona Company has fixed the dividend for 1912 at the rate of 10 per cent. As a result of the reorganisation of the system of taxing the production of diamonds in German South-West Africa, various companies which were compelled to suspend operations owing to the financial burdens of the former tax have again resumed activity. Among these (states the " Luderitzbuchter Zeitung ") are the Zillerthal Company, the New Karlsthal, and the New Phœnix, whilst the fields of the Swakopmund Diamond Company, which have been acquired by the recently formed Luderitz Bay Mining Company, are also being worked again. The scarcity of labour has now been overcome, as 400 Ovambo labourers reached the diamond fields at the end of April, and working operations have even been extended. The working of the northern fields has also been assured, as the financially strong Colonial Mining Company took over on April 15th the fields of the Diamond Fields Utilisation Company, including the option held by the latter on the fields of other producers and prospecting companies, and has undertaken to form a working company with a capital of £40,000.

* * * *

Rezende.

During the year 1912 the Rezende Company completed the purchase of the Penhalonga mine, in respect of which 17,932 shares were issued, raising the capital to £118,435. An increased tonnage and a higher grade of ore was milled, and during a part of the year the company had the benefit of its auxiliary hydro-electric plant, the largest in Africa, which was completed and is running quite satisfactorily. In the result the company made the considerably increased profit of £21,987, in addition to which £5,785 was received from tributors. After placing £6,000 to development reserve and allowing for the dividend of 1s. 6d. per share paid in December, there was a balance of £35,315 to profit and loss, against £22,125 brought forward from 1911. A balance dividend of 1s. 6d. per share, making 15 per cent. for the year, is now recommended. The ore reserves at the end of the year were estimated at 221,095 tons, of which 145,899 tons were in the Rezende and 75,196 tons in the Penhalonga section.

* * * *

Lonely Reef.

The Lonely Reef may be said to have been the most satisfactory property in Rhodesia in 1912. The profits distributed for the year were 30 per cent., and for the first four months of the current year have been at the increased rate of 40 per cent., and in April at the rate of nearly 50 per cent. on the issued capital. The report of the recent meeting shows that the ore-shoot has a remarkable consistency down to the 1,000 feet level, and the latest developments point to a possible extension in length of the rich ground in the lower levels. The richest part of the ore-shoot has hitherto had a pitch to the north, but a winze put down from the south end of the 7th level has, after passing the 8th level, come into ore as rich as the best of the north end of the shoot. The last 55 feet sampled from 45 feet to 100 feet below the 8th level have averaged 53 dwts. over 42 inches. The directors have declared an interim dividend of 10 per cent.

* * * *

The General Mining Year.

The complete report of the General Mining and Finance Corporation for 1912 is now available to supplement the particulars published in March last. The continued depression in South African mining securities which prevailed during the year, and which was accentuated by the political unrest in Europe, necessitated the further writing down of the book value of the company's share investments by £67,841. It is pointed out that the aggregate book cost of the share investments, as shown in the balance sheet, is less than the valuation at market prices at the end of the year, but of this unrealised profit no account has been taken, and in no case has an asset been written up. The companies under the management and control of the corporation, and in which are the major portion of its share and debenture investments, are: Aurora West United, Cinderella, Meyer and Charlton, New Goch, Roodepoort United, Van Ryn, West Rand Consolidated, New Steyn Estate, and Rand Collieries, their total issued capitals amounting to £5,911,476 10s. They own properties on the Main Reef series comprising 8,545 claims, and also freehold land 19,007 acres in extent, and coal rights over about 5,910 acres. The seven producing mines treated 2,032,813 tons for a gross profit of £766,768, while the fully developed payable ore reserves at December 31st aggregated 5,820,000 mining tons, of an average assay value of 6·26 dwts. per ton. The directors state that the financial depression and other unfavourable conditions referred to in the previous annual report continued during the past year in a still more acute degree, with the inevitable consequence that the possibilities of profitable business have been restricted. One of the many propositions considered by the board—an industrial enterprise in Russia—was undertaken conjointly with other financial groups in London, Paris and St. Petersburg, and resulted in a satisfactory profit, which, however, was only realised since the close of the year, and therefore does not appear in the accounts. The threatened political situation in Europe naturally influenced not only financial institutions, but also the public towards a policy of inaction as regards the investment of new capital, and it was, therefore, impossible to launch with a reasonable prospect of success any schemes having for their object the introduction of additional capital into South Africa. The prejudicial effects of this state of apathy are reflected in the accounts of the corporation, not only as regards the smaller revenue earned, but also in the necessity for allocating the profit of writing down certain of the holdings of the corporation in order to reduce the book value to at least the abnormally low level of ruling Stock Exchange quotations.

TOPICS OF THE WEEK.

THE NEW KLEINFONTEIN STRIKE.

The strike at the New Kleinfontein, at the moment of going to press, appears to be fizzling out. The men are going back to work in twos and threes, and it seems only a question of a few days before the movement collapses. Since the management publicly conceded all the men's demands and offered to reinstate those who returned by the 11th, the struggle has resolved itself into an attempt to vindicate the dignity and authority of the Trades Hall officials, who regard themselves as slighted by the fact that the management refuse them recognition. The management, of course, cannot possibly submit to such outside dictation, and are now following the only reasonable course open to them, by proceeding to work the mine with as many ex-strikers as voluntarily return, in conjunction with aid from outside. It is earnestly to be hoped that the victims of the agitators' eloquence will, before it is too late, recognise that they are being sacrificed to the glorification of a few professional agitators, and that, having gained everything they came out on strike for, they should be content. The mischief-makers have done their worst to the mine: the men alone now stand in need of sympathy and good advice, otherwise some of the more easily-led of them may, in the end, be left lamenting.

CROWN MINES.

The speech made by Mr. Samuel Evans at the annual meeting of the Crown Mines will be found elsewhere in this issue. Its clearness and comprehensiveness leave little to be explained or added, though, in view of the importance of the undertaking, the salient features cannot be over-emphasised. On the much-debated question of dividend, Mr. Evans, in reply to a shareholder, put the matter in a nutshell when he said: "As far as we are concerned it is purely a question of labour. If we can get more labour, you will get more dividend. . . . . . We had 850,000 tons spare capacity in our reduction plant last year, and we have considerable spare capacity at present." In the course of his speech Mr. Evans made the same point in another way. "I have had inquiries from shareholders," he said, "asking when the dividend is likely to be increased to 130 per cent., the figure mentioned at the time of the amalgamation. I am not in a position to give a definite answer to that question to-day, but I need hardly say that this point is kept constantly in view by your board, and so far as we can see at present our decision must be governed by the supply of unskilled labour, which so vitally affects our profits." In regard to the technical side of the big amalgamation, Mr. Evans was able to refer shareholders to the excellent paper lately prepared by the General Manager, Mr. R. C. Warriner. The greater portion of that paper appeared in our columns, and gives a minute and exact illustrated account of the property. The work of concentration, reorganisation and enlargement necessitated by the amalgamation is practically completed. Since August last year, the Chairman explained, they had been working the property as one mine and not as a collection of mines under one management. Both underground and on the surface the separate mines and the different installations have been merged together so that they are steadily getting into a position in which they shall derive all the advantages that are to be gained from large scale production by one concern. Working costs, Mr. Evans admits, are still undoubtedly high, but he is able to advance good reasons why they should be substantially reduced. On the all-important question of ore reserves, Mr. Evans showed that the position was a satisfactory one. He, of course, did not lose sight of the fact that as development increases the ore reserves in the Robinson Central Deep will continue to diminish gradually in proportion to the ore reserves in the rest of the property. This, however, need not cause anxiety to shareholders having regard to the satisfactory character of the ore which has recently been opened up in all the lowest levels in the central and western sections of the mine. At the end of last year payable ore reserves were estimated at 10,607,671 tons carrying gold of the value of 29s. 9d. per ton, as compared with 10,124,072 tons and 30s. 5d. in 1911, and 6,282,719 tons and 31s. 11d. in 1910. "Our policy," said Mr. Evans, "is to maintain the tonnage of payable ore in the reserves at about the present level of rather more than 10,000,000 tons, and in order to make sure of doing that we estimate that we must drive, raise, sink and crosscut to the extent of about three-quarters of a mile per month." Moreover, Mr. Evans was able to announce that recent disclosures in depth are of a most encouraging character. This remark is particularly applicable to the Langlaagte Deep section. In that portion of the property there has recently been developed close on half a million tons below the 11th level; practically all the ore exposed is payable, the reefs are wider and the values are higher than the average of the ore reserves above the 11th level. The position in the South Rand section is also very satisfactory, as all the development work done below and immediately above the 13th level more than maintains, both as regards widths and values, the average of the Crown Deep levels opened up in the past few years. "I may say," concluded the Chairman, "that taking the whole of the central and western portions of the Crown Mines the ore disclosed in the lowest levels is uniformly good and considerably better than the estimates framed prior to the amalgamation. Under these circumstances, I have no hesitation in saying that the present outlook justifies shareholders in viewing with considerable satisfaction the position as far as our ore reserves and our future prospects are concerned.'

WHITE LABOUR ON MINES.

The Select Committee of the Assembly that recently investigated the possibilities of extending the field for white labour naturally devoted a great deal of attention to the Rand. To Mr. C. H. Spencer it was indebted for the preparation of a particularly lucid and valuable statement, put in by Professor Lawn, on the question as it affected the mines. In the course of the report, the Committee observes that it may seem a paradox that there should be unemployment and poverty in a country where there is in the mines a wealthy industry employing hundreds of thousands of workmen, skilled and unskilled, and always crying out for more labour. The Committee has taken considerable evidence on the question of the possibilities of further employment on the mines, and it has had the advantage of reading the able and exhaustive report of the Mining Industry Commission of 1906-7. Particular emphasis is laid on the evidence of Mr. W. N. Honnold and Mr. Ross Skinner and Professor J. G. Lawn as bearing on the economic side of the question. Speaking generally, while acquitting those who control the mines from any actual hostility to the employment of unskilled white labour, the Committee is compelled to say that their attitude is far from sympathetic and it is not convinced that any strenuous efforts, like those put out by the South African Railways, have ever been made to find a field of employment for such labourers. The report proceeds: As a mere economic question it is difficult to understand how it is found possible to work mines of an ore value not exceeding those on the Witwatersrand at a profit in other countries on an extra-European scale of wages, while such a course is declared to be out of the question in South Africa. The answer to this and similar questions must be looked for in the social conditions of this country where there is a vast supply of efficient, and not unintelligent, labourers content to work at a lower wage than Europeans, and whose employment on similar work, side by side with them, is contrary to the feeling of the community. The Committee could not recommend any attempt to bring about a partial change which would involve a vast economic and social upheaval and probably fail in its object owing to the difficulty of finding substitutes in this country or elsewhere for the labour force now employed. Another reason which operates against the increased employment of Europeans as a substitute for natives is to be found in the health conditions prevailing in the mines. More than one witness testified to the alarm now felt at the results brought about by miners' phthisis, and the deterrent effect upon those who were looking to skilled employment, and until more thorough investigation is made into the conditions with regard to pneumonia, tuberculosis, and from the increased humidity of the mines, a grave responsibility rests upon those who urge the employment of unskilled Europeans underground, whose services must of necessity be continuous as a substitute for natives, whose short service is held to be a great protection against these evils. The Committee believes that there is a scope for the employment of unskilled Europeans on economic terms on the surface, where a really sympathetic effort on the part of employers might produce at least as good results as similar ones have done on our railways. The Committee directs attention to the evidence on the results of the employment of unskilled Europeans, both on the open railway lines and on construction works, which, looking to the time the experiments have been in progress, are most encouraging. A continuance and extension of this work is strongly urged. The report adds:—There is more to be said for the efforts that are being made to open up the field of skilled and semi-skilled occupations for the European born in South Africa. The Committee is pleased to learn that European labour has largely, if not entirely, superseded native labour in the mills on the Witwatersrand and to notice that inducements are held out to apprentices and learners in the mines. It cannot too strongly recommend that the opportunities for apprenticeship both here and in other avocations should be encouraged and extended. It draws attention to the evidence given in regard to the Government Mining School on the Wolhuter Mine and of that of Mr. J. W. Quinn, M.L.A., in regard to the too prevalent practice of lads leaving their occupation when half taught, seduced by the facility that offers of obtaining good wages, which is calculated to lead to an output of slipshod workmen unfitted to enter into competition with the better skilled artizans coming from oversea. It is satisfactory to learn that in physique, in capacity and above all in the ability to manage natives, the South African leaves nothing to be desired if he can be induced to add thoroughness to his other good qualities. The statement prepared by Mr. Spencer for the Committee, though too long and detailed to quote here, leaves no doubt regarding the economic impossibility of increasing the field for white employment underground in the mines. Our readers will be familiar with the line of argument followed by Mr. Spencer, but it is well that his evidence has been put on permanent record in a bluebook, in order that it may be available to correct the oft-resurrected fallacies of the so-called "white labour school."

THE SITUATION AT THE CINDERELLA.

The decision by the board of the Cinderella Consolidated Company temporarily to suspend crushing operations at that ill-starred mine will not come as a surprise to shareholders or to the public in general, since it has been evident for some time past that the mine is working under exceptional difficulties and that ore sent to the mill under present circumstances cannot be expected to give returns in any way representative of the profitable potentialities of the mine. Moreover, at the annual meeting of the company, held the other day, Mr. George Nathan, who presided, prepared shareholders and employees for the step which is now being taken. Mr. Nathan, it may be recalled, said: "As it is inadvisable to continue crushing high-grade ore without a profit, your board has instructed the company's engineers to examine the mine with a view to ascertaining whether it is possible to reorganise working conditions in such a manner as to bring about the necessary reductions without interfering with milling, or whether it is advisable to suspend milling for a period, during such possible reorganisation. Pending the receipt of the engineers' report on their investigation, it has been decided to give provisional notice to those of the present employees whose services would not be required during the suspension of crushing, in order that, in the event of the latter policy being adopted, no unnecessary expenditure need be incurred." The results of the technical investigation have been such that the board has now decided to suspend milling operations. A large number of natives are being released from the property, and the majority of these will be absorbed by other mines.

DIAMONDS IN THE BANKET.

Further Discoveries at Modderfontein and the Central Rand—A Plea for Preservation of the Gems in Museums.

Is the Rand to receive a further accession of wealth through the recovery of diamonds in the mortar boxes of our mills and in black sands and other metallurgical products? The idea of a Modderfontein B and a De Beers rolled into one, or of a Meyer and Charlton united with a Premier, for example, is rather too staggering to contemplate. The fact remains, however, that the Main Reef series does in certain areas contain diamonds, and it is quite possible that for every one found a large number have been smashed or ground to pieces by stamps or tube mills and have passed on to the dump heaps.

The Modder B. Finds.

We learn that three more diamonds have just recently been found at the Modderfontein B. gold mines. If this sort of thing continues, some of the optimists will be expecting the installation of a washing gear and the distribution of dividends from diamond as well as from gold mining operations on that successful property! Of course, the discovery is of purely academic interest and invites all sorts of theories as to the origin of the gem stones in the banket. One suggestion is that the diamonds in question are "borts" detached from diamond drill crowns during boring operations and as a very considerable number of holes were put down at Modder B. during the preliminary exploitation of that property the theory might seem to have something to be said for it. But this explanation falls entirely to the ground inasmuch as all the diamonds found in the Banket both at Klerksdorp and in closer vicinity to Johannesburg are of a characteristic green colour. In addition to the Modderfontein B. discoveries, we understand that a diamond has recently been found in black sands at a Central Rand mine.

Professor Young's Views.

It may be recalled that some little while ago Professor R. B. Young read a paper on diamonds in the banket before the Geological Society of South Africa, in the course of which he remarked —According to Mr. J. Ballot, two diamonds were found in 1889 in the mortar-boxes of the Wolhuter G.M. and Percy G.M., and the stone from the latter mine was described by Mr. Ballot, who had it in his possession, as being of a light green colour. A considerable number of diamonds had also been discovered at Klerksdorp, from the Gold Estates Reef, Elsberg series, a body which was advertised in the name of a company that worked the reef—namely, the Klerksdorp Gold and Mining Co., Ltd. Some weeks ago, said Professor Young, a diamond was found in the black sands from the mortar-boxes of the Modderfontein G.M. by A. C. Laurie, at present a student in the S.A. School of Mines and Technology. The stone was about three-quarters of a carat, and was of a light greyish olive-green colour. This, as far as the speaker knew, was the third diamond recorded as having been found from the Main Reef series. It was a noteworthy fact that the colour, when stated, of the diamonds found, was invariably green. It might be considered certain, he said, that diamonds in the banket were deposited with the pebbles during sedimentation, and that occurrence was interesting, as it proved there existed a series of diamonds in the pre-Witwatersrand rocks. Concluding, Professor Young said that black sands from the mortar-boxes were worthy of careful examination, as already there had been discovered in them iridosmine, gold telluride, and diamonds, all of which occurred in such small quantities that probably their presence would have been undiscovered had it not been for careful watching.

No Stones in Museums.

Whilst on this extraordinarily interesting subject, we would venture a word of protest against the keeping of these mineralogical curiosities by individual persons. We understand that not one of these green diamonds is in a South African museum or public geological collection, and if this be true, as we believe it to be, it is a matter to be deplored. The stones are of such scientific interest that it seems a shame that they should be put to no more useful purpose than the adornment of high managerial officials.

View of New Kleinfontein: Scene of the Miners' Strike.

THE GLOWING POSSIBILITIES OF THE FAR EASTERN RAND.

Mines Likely to be Milling Nearly Ten Million Tons per Annum in Five Years' Time—A Field for Enormous Expansion.

It seems probable that in five years' time the Further East Rand will have over two thousand high duty stamps, plus tube mills, at work, or their equivalent, and that these will be crushing at the rate of almost ten million tons per annum. We are tempted to make this prediction by reason of the facts that the Modderfontein Government Areas Company has just recently announced that plans are in course of preparation for the erection of a battery of 50,000 tons per month initial capacity, which will at a later date be increased to 100,000 tons, and later still, as development warrants extension, to a larger capacity; that the directors of the Modderfontein Deep Levels Company are considering the type and size of plant to be erected for that mine; that the Van Ryn Deep and Geduld mines are about to start up their new plants; whilst the Brakpan Company is erecting further stamps and tube mills, and that other companies are, in view of the general excellence of developments in this vast annexe of the Rand gold field, considering the erection of additional reduction and treatment plants. In our issue of May 17th last we gave some thought-compelling figures on the subject of the Further East Rand gold field, and we therein showed that whereas in March of 1909 three mines only were milling, and that they were operating 480 stamps and seven tube mills, and crushing at the rate of a million and three-quarter tons per annum, there are to-day six mines producing, employing 805 stamps and 32 tube mills, and crushing nearly three million tons (on the March, 1913, showing) per year.

More recent developments and announcements tempt us to pursue this record of expansion still further, and we hereunder present a table, in which we attempt to further indicate the enormous productive and spending potentialiites of the Further East Witwatersrand. Predictions in regard to gold mining are proverbially risky, but in the appended estimates we think we have erred on the safe side, and that well before the close of the present decade the mines lying to the east of Boksburg will have equipments milling at the rates denoted hereunder at work. For purposes of contrast we state the equipments at work on the mines in question last month:—

Mine.	Present Milling Equipments at Work.			Monthly Tonnage Probable 5 years hence.
	Stamps.	Tube Mills.	Tons Milled May, 1913.	
Apex-Benoni	—	—	—	30,000
Brakpan Mines	160	8	56,000	70,000
Brakpan Leases	—	—	—	70,000
Cloverfield-Welgedacht-Geygerle	—	—	—	30,000
Daggafontein	—	—	—	?
East Rand Mining Estates...	—	—	—	?
Geduld Proprietary	50	2	15,000	30,000
Modderfontein B.	80	5	36,000	70,000
Modder. Government Areas	—	—	—	100,000
Modder. Deep Levels ...	—	—	—	50,000
New Kleinfontein	200	4	45,000	45,000
New Modderfontein	180	7	52,000	100,000
Rand Klip	—	—	—	?
Rand Collieries and Witpoortje Leases	—	—	—	40,000
Springs Mines	—	—	—	50,000
Van Dyk	—	—	—	30,000
Van Ryn	140	6	40,000	40.000
Van Ryn Deep	—	—	—	50,000

We wish to make it clear that the foregoing estimates have not been supplied to us officially, but they are based on the size of the properties concerned, their general prospects as indicated by relative situation and development where development has been effected, and by such announcements as have been made by company chairmen as to future policy. The calculations presuppose, of course, that future developments will warrant the raising of the sums of money required to instal the equipments in question, and also that the labour position will admit of the mills being worked to the capacities stated. It may be remarked that the above figures total up to 800,000 tons per month, as compared with a quarter of a million per month at present, and this apart from properties like Daggafontein, Welgedacht and Grootvlei, of the East Rand Mining Estates, which in five years' time should at least be about to enter the productive arena. We have refrained from venturing figures as to stamps and tube mills, as the new batteries may have units disproportionate in point of capacity to such as are at present in use.

A Sheba Dividend.

A cable was received this week from the London office advising that the Board of directors have declared a dividend of 7½% (seven and one-half per cent.), being the third interim dividend declared on account of the financial year ending on the 30th June, 1913. This dividend is payable on the 14th July to all shareholders on the register at the 16th June, 1913.

South African Lighting.

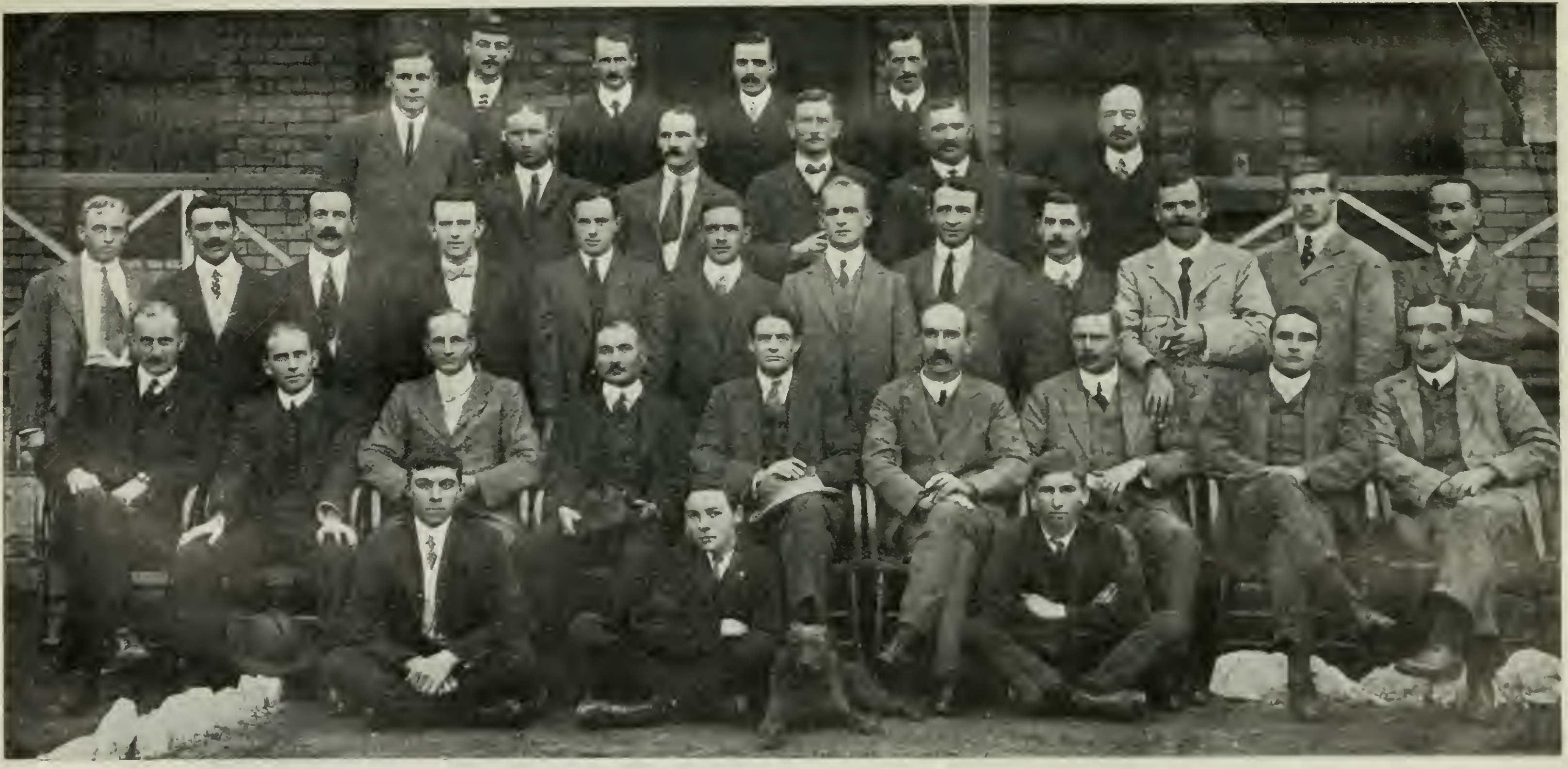
The report of the directors of the South African Lighting Association, Ltd., for 1912, shows continued improvement in the profits. At both Port Elizabeth and Grahamstown there has been an increased consumption of gas and a larger number of consumers. The directors feel justified in recommending an increase in the dividend, and, after placing £1,000 to reserve, they propose the payment of 9 per cent. for the year, subject to deduction of income tax, as against 7½ per cent. free of tax a year ago. Of this dividend, 3½ per cent. was paid in October last, leaving 5½ per cent. now payable.

Solomon's Tin.

It is proposed to reconstruct this venture by reducing the capital from £102,000 to £10,000, divided into 200,000 shares of the nominal value of 1s. each, giving to present ordinary shareholders 100,000 1s. shares in exchange for 100,000 ordinary £1 shares, and to "A" shareholders, who are entitled to half profits, 100,000 1s. shares in exchange for the present 40,000 "A" shares; thereafter to increase the nominal capital from £10,000 to £17,500 by the creation of 150,000 shares of the nominal value of 1s. each, and issuing such 150,000 shares with the object of providing £7,500 sterling in cash.

Notice has been given to Edwin Charles Burton, Esq., care of A. J. K. Hendry, Esq., solicitor, P.O. Box 3272, Johannesburg, entitling him to peg on or before the 8th day of July, 1913, on the farm Bongaspoort No. 26 (Spies' portion), Piet Retief district, in the mining district of Heidelberg, Transvaal Province, ground equal to thirty-two claims as an award in respect of a discovery of reef gold made by him on the said farm.

THE MANAGER AND STAFF OF THE JUPITER GOLD MINING COMPANY, LIMITED.



On Ground (from left to right): B. Gibb, shiftboss; G. Collier, office junior; F. Standing, store junior.

First Row: L. Gordon Smith, assistant secretary; R. G. Else, mine captain; P. W. Croft, mine captain; R. M. Kayser, underground manager; J. M. L. Henry, manager; D. R. Kerr, engineer; E. H. Barton, secretary; P. Moorshead, surveyor; W. Wilson, mine captain.

Second Row: G. Henderson, sampler; W. S. Elrick, shiftboss; J. A. Loubser, assistant surveyor; D. W. Phillips, shiftboss; F. E. Sievewright, shiftboss; A. L. Greenway, assistant timekeeper; N. C. Archibald, statistician; A. Rose Innes, shiftboss; B. H. Bromilow, accountant; W. J. Cornwell, draughtsman; W. A. Quince, shiftboss; C. Ryan, timekeeper.

Third Row: A. S. Good, shiftboss; L. C. Biccard, shiftboss; H. Bodley, sampler; H. E. Goodman, storekeeper; G. Moir, foreman smith; R. A. Duthie, mine captain's clerk.

Fourth Row: B. Lindhorst, assistant surveyor; G. Brinton, head sampler; J. F. Lochhead, foreman electrician; T. P. Smith, foreman fitter.

THE YEAR AT THE ROBINSON DEEP.

Extensive "Safety" Work—Ore Reserves and Recoveries—Reports by Messrs. Leslie and Wessels.

A FEATURE of operations at the Robinson Deep G.M. Co. during the year ended with March 31st last has unquestionably been the care bestowed on keeping the working places safe. It is no secret now that a year or two ago the state of the Robinson Deep mine left much to be desired from the point of view of safety of workers. A bold and comprehensive policy was then decided on and the position at present gives no cause for anxiety. At the same time it is fully recognised that continual care is necessary and maintenance work is constantly proceeding. On this subject Mr. J. J. Wessels, the manager of the mine writes as follows in his annual report just issued:—Sand filling was commenced towards the end of February, and it is hoped that in the course of a short time all the current sands will be sent underground. The expense of keeping working places safe is very considerable. During the year an average of 48 white men and 208 natives were employed daily on work providing for the safety of others at a total cost of £35,309 12s. 0d., or nearly £3,000 per month. Certain areas are being filled up with sand, and, when these are completed, not only will greater safety be procured, but the cost of timbering and packing will also be greatly reduced.

Mr. C. D. Leslie, the company's consulting engineer, writes under date May 30th:—A re-estimation of the ore reserves shows that at 31st March last the fully developed payable ore amounted to 1,538,000 mine tons of an average grade of 6·0 dwts., and, in addition, there were some 346,000 mine tons of partially developed ore of an indicated average mine grade of 5·88 dwts. per ton. The actual value per ton of the ore reserves remains about the same as reported last year, but it is considered more reliable to record the tonnage and value over a stoping width, as above, than over a milling width as formerly. The decreased recovery value of 2s. 4·7d. per ton, taken in conjunction with an increase in working costs of 2·25d. per ton, resulted in reduced profit from working of nearly £60,000, as compared with the previous year. The recovery value was influenced by the inclusion of a higher percentage than formerly of low-grade reclamation ore, while the slight increase in working costs was entirely attributable to excess expenditure incurred on renewal of plant. There was an increase in development footage for the year of 1,427 feet.

The manager's report states that the total amount of development work carried out during the year amounted to 16,982 feet. In all 696,524 tons of rock were hoisted, of which only 3·48 per cent. were broken by hand. Machines broke 73·21 per cent., 50,428 tons, or 7·24 per cent., were taken from development, and 111,931 tons, or 16·07 per cent. from reclamation. The milling, tube milling and recovery figures are as under:—183 stamps ran 332·140 days, crushing 623,800 tons, giving an average duty per stamp of 10·263 tons per day and producing 37,301·715 ozs. of fine gold.

TUBE MILLING.

Eight tube mills ran 319·078 days, treating 623,800 tons, yielding 111,124·218 ozs. of fine gold. The total output of gold was valued at £920,333. In addition to the above, £11,644 8s. 5d., the value of 2,777·993 ozs. fine gold recovered from dismantled mill plates, and £856 15s. 5d., the proceeds of sale of dismantled copper plates, have been placed to the credit of reserve for additions and renewals to machinery and plant account.

RESERVE GOLD.

Gold in reserve at 31st March, 1912, 1,552 ozs., value £19,080 9s. 3d.; added to reserve during year, 1,000 ozs., value £4,191 13s. 4d.; total, 5,552 ozs., value £23,272 2s. 7d. Taken from reserve during year, 4,552 ozs., value £19,080 9s. 3d.; gold in reserve at 31st March, 1913, 1,000 ozs., value £1,191 13s. 4d.

WORKING EXPENDITURE.

	Amount.			Cost per ton.	
	£	s.	d.	s.	d.
Mining Expenses	308,837	10	1	9	10·822
Development	60,291	1	3	1	11·196
Ore sorting and crushing ...	8,524	14	4	0	3·280
Transport of quartz	5,002	18	0	0	1·925
Milling expenses	34,042	18	6	1	1·098
Tube milling expenses ...	28,585	18	5	0	10·998
Cyaniding sand	28,739	2	3	0	11·057
Cyaniding slime	18,434	3	5	0	7·092
General charges	42,041	4	3	1	4·175
	£534,499	10	6	17	1·643
Expenditure on renewals and replacements of plant, buildings, etc	20,245	3	0	0	7·789
	£554,744	13	6	17	9·432

The following statement gives the results of the operations for the year:—

	Value.			Value per ton.	
	£	s.	d.	s.	d.
623,800 tons crushed, yielding from all sources ...	920,333	5	4	29	6·088
Working expenses (including £20,245 3s. 0d. expended on renewals and replacements)	554,744	13	6	17	9·432
Profit on working ...	£365,588	11	10	11	8·656

Less levies under miners' phthisis legislation, French Government duty and stamps, etc., £8,300 4s. 0d.; less sundry revenue, £6,549 0s. 4d.; total, £1,751 3s. 8d.; leaving a net profit on working of £363,837 8s. 2d.

Jumpers-cum-Treasury.

The following cablegram has been dispatched to the London office:—"The following is the result of the joint working of 'The Jumpers' and Treasury companies during last month: 50 stamps, working 25 days, crushed 5,100 tons, yielding 1,243 ozs. fine gold from mill, 702 ozs. fine gold from tailings by cyanide, 277 ozs. fine gold from current slimes, and 362 ozs. fine gold from accumulated slimes: total from all sources, 2,584 ozs. fine gold. Value of output, £10,854; joint profit for the month, £1,007. Position of joint gold reserve at end of month, 604 ozs. fine gold."

East Rand Proprietary Mines.

The following is the text of a cablegram despatched to the London office of the East Rand Proprietary Mines:—The results of last month's operations are: 820 stamps milled 170,000 tons; 60,837 ozs. of fine gold recovered, including 1,521 ozs. of fine gold recovered from the accumulated slime; £95,014 profit for the month, including £4,520 profit from the accumulated slime. The following are the monthly profits for the first five months of 1912 and 1913: January, 1912, £67,108; 1913, £95,698. February, 1912, £75,609; 1913, £89,511. March, 1912, £101,362; 1913, £95,010. April, 1912, £98,596; 1913, £95,201. May, 1912, £95,024; 1913, £95,014.

THE BEWAARPLAATSEN CLAIMS.

A Complete Schedule—Terms of Disposal.

References to bewaarplaatsen claims at two or three recent annual meetings and the debate on General Smuts' Bill in the House of Assembly serve to direct increased attention to these pieces of ground which in the early days of the Rand were applied for by mining companies for residential, battery and depositing sites and other purposes. Sir Lionel Phillips has assessed the capital value of these bewaarplaatsen rights at nearly two millions sterling, and as evidencing the importance of the Bewaarplaatsen Bill to the industry it may be remarked that should this Bill become law the Robinson Company will, through disposal of the moneys accruing through the leasing of the undermining rights of bewaarplaatsen, benefit to the extent of about £160,000, the bulk of which will be received in the next four years. The Crown Mines will also benefit considerably, as shown by the following passage in the speech of the chairman last week. He said: "The Commission which inquired into this matter in 1909 and 1910 recommended in their report—February 26th, 1910—that the owners of the freehold should receive 50 per cent. of the total moneys accruing to the Crown from the leasing or other disposal of rights to mine under bewaarplaatsen, water-rights, and other reserved areas. The Government have brought before Parliament a Bill to give effect to this recommendation, and should it become law our immediate financial position will be improved to the extent of about £11,000 plus interest, as soon as the Treasurer refunds to our company its share of the moneys received by the Government for the mining rights under the reserved areas of which the Crown Mines owns the freehold. The Crown Mines share of the revenue from the reserved areas already leased amounts to £22,000 per annum for a period of ten years and £9,489 for a further period of five years, and I may add that our company is also the freehold owner of about thirty-three bewaarplaatsen claims which have not yet been disposed of by the Government." The whole subject is of such importance to the industry and the country generally that we give below a schedule of bewaarplaatsen taken from the report of the Secretary of Mines for the year ended December 31st, 1911. Certain of the payment terms have, it appears, been re-adjusted since this list was published, but the schedule nevertheless enables one fairly accurately to judge of the sums of money involved.

Name of Company.	Farm.	Description of Rights.	Total Area Claims.	Terms of Disposal.			
				Successful Tenderers.	Per annum.	Period Years.	Present Value of Annuities as per Tender.
1. Robinson G.M. Co., Ltd. Robinson Deep G.M. Co., Ltd. Crown Mines, Ltd.	Turffontein No. 21	Worcester Bewaarplaatsen Nos. 1121/30 Robinson and Ferreira Water-right No. 398, and Machine Stands Nos. 79-174 Northern portion of Water-right No. 360	15·83	Robinson G.M. Co. Ltd..............	£46,576	6	£227,650
				Robinson Deep G.M. Co., Ltd...	28,998	10	211,301
				Crown Mines, Ltd	19,979	15	192,538
							£631,489
				Plus Profits Tax and Rental equal to Claim Licences. First payment due 30/9/11.			
2. City Deep, Ltd.........	Doornfontein No. 24......	Water-right No. 353...... Water-right No. 354...... Water-right No. 329...... Bewaarplaats No. 1011.... Machine Stands Nos. 338-43	13·54	Annuity of £6,560 for 20 years. Present value of annuity, £75,215. Government will also receive Profits Tax and rental equal to Claim Licences. First payment due 1/7/11.			
3. New Modderfontein G.M. Co., Ltd.	Modderfontein No. 17....	Water-right No. 456...... Water-right No. 457......	48·97	Annuity of £17,310 for 20 years. Present value of annuity, £198,476. Government will also receive Profits Tax and rental equal to Claim Licences. First payment due 1/4/11.			
4. Village Deep, Ltd.......	Turffontein No. 21........	Water-right No. 371......	7·37	Annuity of £5,172 for 6 years. Present value of annuity, £25,281. Government will also receive Profits Tax and rental equal to Claim Licences. First payment due 1/10/11.			
5. Roodepoort Central Deep, Ltd.	Roodepoort No. 43........	Water-right Nos. 60-54....	16·14	Government will receive £1,000 cash on signing of agreement.			
6. Johannesburg Consolidated Investment Co., Ltd.	Lots Nos. 191 and 192, Section D, Barberton.	Bewaarplaatsen Nos. 386-91 Machine Stands Nos. 338-41, 392-3.	6·25	Amounts payable to Government—£523 cash with a further amount of £419 in the event of the tailings being worked.			
7. Meyer & Charlton G.M. Co., Ltd.	Doornfontein No. 24	Bewaarplaatsen Nos. 784, 809 and 1559. Water-rights Nos. 40, 345, 355. Portion of Bewaarplaatsen Nos. 1366-75. Portion of Water-rights Nos. 93 and 95. Mining Stands Nos. 54-5..	13·73	Annual payment—11·0625%* of net produce plus Profits Tax and rental equal to Claim Licences. Estimated present value of Government's share of profits from Rights over and above Profits Tax, £73,924. Estimated first instalment, £8,627. First instalment due on 1/8/10.			
8. Jupiter G.M. Co., Ltd...	Elandsfontein No. 11, and Elandsfontein No. 6.	Water-right No. 300...... Water-right No. 125...... Water-right No. 323...... Water-right No. 403...... Water-right No. 369......	24·80	Government will receive £7,410 cash on signing of agreement.			

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* Re-adjustment has taken place and amount now payable is 10.86 per cent., plus profits tax.

Name of Company.	Farm.	Description of Rights.	Total Area Claims.	Terms of Disposal.
9. Cinderella Consolidated G.M. Co., Ltd.	Vogelfontein No. 5 and Leeuwpoort No. 4.	Portion of Boksburg Township and dam, and Vogelfontein Township. Water-right No. 479......	30·84 45·85	Annual payment—4·169% of the profits as defined in Section 4 (1) of the Mining Taxation Act, 1910. First payment due as from 1/1/10. Estimated present value of Government's share from rights, £175,192.
10. Wolhuter Gold Mines, Ltd	Doornfontein No. 24......	Portion of Bewaarplaatsen Nos. 1366–75. Portion of Water-rights Nos. 93 and 95. Water-right No. 293......	12·30	An annuity of £7,931 for 10 years. Present value of annuity, £57,796. Government will also receive Profits Tax and rental equal to Claim Licences. First payment due 31/10/11.
11. Geldenhuis Deep, Ltd...	Doornfontein No. 24.	Portion of Water-right No. 362 and Bewaarplaatsen Nos. 950–2, etc.	17·19	Annuity of £1,903 for 12 years. Present value of annuity, £15,802. First payment due on 31/12/11.
12. Nourse Mines, Ltd.....	Doornfontein No. 24......	Water-rights Nos. 2 and 3 Water-right No. 327...... Machine Stands Nos. 305–6 Bewaarplaats No. 888.... Water-right No. 370...... Portion of Water-right No. 362 .... Portion of Bewaarplaatsen Nos. 950–2, etc......... Mining Stand No. 37...... Machine Stand No. 337.... Bewaarplaats No. 1361.... Water-right No. 6........	21·96	Annuity of £1,632 for 15 years. Present value, £15,735. First instalment due 1/8/12. Plus the sum of £55 cash for the area of ·04 Claims on Mining Stand No. 37.
13. Lancaster West G.M. Co., Ltd.	Luipaardsvlei No. 8......	Water-right No. 229...... Water-right No. 536...... Water-right No. 614...... Water-right No. 176...... Water-right No. 678...... Water-right No. 556...... Water-right No. 572...... Water-right No. 617...... Water-right No. 209...... Water-right No. 628...... Water-right No. 610......	104·51	Government will receive £2,090 on signing of agreement.

Note.—Public tenders were called for only in the cases of the rights disposed of to the Robinson G.M. Co., Ltd., the Robinson Deep G.M. Co., Ltd., the Crown Mines, Ltd., and to the Cinderella Consolidated G.M. Co., Ltd., Nos. 1 and 9 respectively. In all other cases the rights disposed of were insufficient in extent to constitute a workable proposition.

IMPROVING PROSPECTS AT THE GELDENHUIS DEEP.

Difficulties Passing—Smooth Run Predicted—Better Year Now Entered on.

Mr. H. Eckstein was able to end his rather depressing review of the year 1912 at the Geldenhuis Deep in a hopeful and confident note. After dealing in detail with the annual report and accounts, he said:—

"I would like to make it clear that the disappointing results obtained, especially during the last six months of the year under review, when the monthly average of the tonnage milled was 48,300 tons, working costs over 27s. and the profit £8,400, were quite abnormal, and I feel confident that they were due to exceptional circumstances, such as I hope we shall never witness again. You will have noticed a steady all-round improvement during the last few months. Compared with the figures which I have just quoted, the results for the first four months of this year show, on a monthly average, an increase of the mill tonnage of 8,000 tons, a reduction of working costs by 2s. 6d. per ton, and £6,300 increase in profit per month. In addressing you in May of last year, I pointed out the impossibility of attaining the working cost figure foreshadowed at the time of the amalgamation, chiefly owing to the advent of additional burdens which it was impossible to foresee, but I also stated that the management considered that the working costs for the first quarter of 1912, of 24s. 1d. per ton, were excessive. The figure for April of this year is 23s. 5d. If we eliminate from both figures the development charge, which varies from time to time, an improvement of 1s. 9d. per ton is indicated. The possibility of a shortage of water towards the end of the year has been much discussed lately. I might say that as far as this company is concerned arrangements can be made which should prevent any inconvenience as regards the running of our plant. The management will make every effort to maintain the mill tonnage at about 60,000 tons per month. Generally speaking, I know of no reason why the mine should not continue to have a smooth run. Provided no unforeseen difficulties occur, the current year's results should show a very substantial improvement on 1912, which should in turn be reflected in the dividend distribution."

The Denver Rock Drill Manufacturing Co.

A controlling interest in the Denver Rock Drill and Machinery Co. has been purchased from the International Pump Co. of New York by a group of Colorado men, headed by Messrs. D. Bryant Turner and W. H. Leonard, of Denver, and C. B. Schley, of Colorado Springs. The company manufactures the Waugh drill for mining and quarrying, and its output is now used in all parts of the world. An enlargement of its plant is said to be planned as a result of the centralization of the control of the concern. The deal has been made incident to the re-organization of the company as the Denver Rock Drill Manufacturing Co., with a capital stock of $700,000, of which $100,000 is preferred stock.

CROWN DIAMOND MINE.

Washing About to Recommence—Effect of Increased Prices for Stones—Lower Costs and Modern Equipment—Satisfactory Outlook.

Under the energetic management of Mr. T. Dilks, washing operations will restart at the Crown Diamond Mine this month. The property consists of two farms, being in extent about 5,000 acres; the diamond mine, formerly known as the Lace Diamond Mine, is situate on the farm Ruby, the name of the other farm being Driekopjes. The mine itself has been opened up, and is in extent some 100 claims, on which licences are paid to the Orange Free State at the rate of 5s. per claim per month. Some idea of what the mine contains may be gleaned from the first report of the former directors, and also the very favourable reports by the experts, Messrs. Parsley, Corstorphine and Molengraaff. The first report is based on the working of the eastern and south-eastern portions of the mine, where the original shaft was put down when the mine was discovered and opened up. From this section of the mine 47,017 loads of yellow ground were washed between the months of February and October, 1899 (practically to the day the war started), with a small gear, which yielded 9,888½ carats, equal to an average of 21·03 carats per 100 loads, and that portion of the mine, some 100 claims in extent, would, it is maintained, give, and continue to give, at least 15 carats per 100 loads—some experts think more. The western section of the mine is poor, and only yields about eight carats per 100 loads. The middle and northern section of the mine may be poor or may be rich; there is nothing to guide one in arriving at an estimate, for the blue ground from these latter sections of the mine has not been put through the washing pans on account of its hardness, and there are thousands of loads on the floors of this kind of blue. It is very well known that the hard black "blue" contains diamonds of the finest water, as has been evidenced by the finding of some beautiful stones in the matrix, which is lying deposited on the floors. Had the section which was known to be rich been worked by itself, there is no doubt that the Lace Company would have made handsome profits; unfortunately the mine was worked as a whole, and it must be taken that the greater portion which went to the floors came from the western side, which was easier to work on account of the bigger face. Notwithstanding this fact the mine yielded as a whole an average of 11 carats per 100 loads. When the ground was washed from the floors, which was made up of different kinds of blue, it was found that only blue coming from certain portions of the mine, that is from the eastern and south-eastern portion, which is evidently the richest part of the mine, pulverised freely, and that from the other sections of the mine a large portion of the ground was lumpy and mixed with poor ground, which also pulverised, but not readily, and yielded very badly. To get at the ground which pulverised, and the ground which was pulverised though more lumpy, all the blue had to be thrown back on the floors while the broken up ground, the bulk of which was from the west end of the mine, was sent to the washing machines. This not only caused exceedingly heavy working costs, but also prevented the true value of the mine from being ascertained, which now it is declared can be done with the proper crushing plant erected to treat the ground as it comes from the mine direct, instead of first flooring it. By means of this crushing plant the cost of flooring, relifting, extra hauling and breaking up by hand labour (which has proved to be a most expensive method), interest on capital cost of ground floored will be saved. This method of direct treatment has been adopted with very great success by the Premier Diamond Company. From the information shown in the records of the company, one may safely deduct that 150 claims will return a yield of at least 15 carats per 100 loads, which should realise in good markets 40s. per carat, and, if proper supervision be introduced and precautions taken, the wholesale theft of diamonds, which had been known to exist, could be greatly reduced. It is a well known fact that it is the finest stones which are as a rule extracted by the natives. A yield of 12½ carats over the whole mine is expected, and at the prices now ruling for diamonds a very handsome profit on working seems assured.

In an exhaustive report made on the mine by Mr. H. de V. Steytler in 1908, he wrote, *inter alia*, as follows: "The apparent reason why the best portion of the mine was not worked to advantage is to be deduced from the fact that the incline has undoubtedly been put down at the wrong place; had it been put down on the western side of the mine, which has turned out to be the poorest instead of the richest portion of the mine, the richest portion of the mine would have been worked to advantage instead of being blocked, as it is at the present time. By the introduction of an aerial gear, which is absolutely imperative to work the mine as it now stands to the best advantage, ground can be pulled from any portion of the mine, and by hauling night and day at least 2,000 loads could be hauled and washed daily, which, compared with the number of loads washed in the past, would greatly reduce the costs per load. It will be necessary, so as to be able to work at night time, to introduce an electrical installation, but this will not be an expensive item. There is a magnificent water supply on the estate, obtainable from a dam built on the company's property, which is estimated to hold 300 million gallons, and having a catchment area of over 40 square miles. The dam is now full, and there is no likelihood of it ever being emptied again, as it will be sufficient to supply all the water required for a period of two years if not a drop of rain falls during that period. The great difficulty which the late company had to contend with on account of the want of sufficient water supply has been entirely overcome, after having had to struggle for about six months to carry out its washing operations with a very scanty supply of water. The want of water during the year 1906, before the dam, which had been completed during that year had filled, helped in a great measure to add to the very high cost of working. The general cause of the failure of the Lace Mine to work at a profit can be undoubtedly ascribed to the want of knowledge of the different kinds of mining ground hauled from the mine, and in consequence the flooring of soft blue, hard blue and hardibank on the same floors, which fact accounted for the estimate of lifting and washing a load of blue ground at 8d. per load to be exceeded in practice by 1s. 10d. per load. To get this ground to the machines it was necessary to have three gangs of natives on the floors—one to break up the blue ground and separate the soft from the hard blue, one to throw back from the soft blue lumps of hard blue and hardibank (all done by hand labour), and the other to load the trucks. By means of the crushers the ground mined will be passed into the crushers direct from the trucks and direct from the crushers into the washing pans, thus obviating all the aforesaid hauling, flooring and labour. Had it been known that the blue ground in the mine would not all pulverise readily, there is no doubt a system of direct treatment would have been introduced when the blue ground in the mine was reached. During 1906 the Lace Diamond Company realised as much as 37s. 6d. per carat for their diamonds; the average price for over twelve months after diamonds had commenced to fall was 27s. 6d. per carat. The reason why the property had to be sold is ascribable to the fact that the company was in debt and that on account of the serious slump in the market monetary assistance to continue operations was not obtainable."

Mr. Steytler's views were amply confirmed in a report made by Mr. T. G. McLelland about the same time. He wrote, *inter alia*: "I have carefully read your report on the Lace diamond mining property, and I cannot see where I can improve much on it, as you seem to have covered the whole position of the property clearly and explained what is necessary to make the mine a payable proposition, providing the price of diamonds can be obtained. To show you, however, my confidence in the mine, before leaving Johannesburg for London in July, 1907, I had an interview with Mr. Lace, chairman of the company, offering at that time to take the property on tribute. To this proposal he stated the directors would never agree. I then proposed to him, if the directors intended reconstructing the company, I was prepared to assist doing so, and while in London several letters and cables then passed between Mr. Lace and myself. After this I determined to go out to the Cape in January last to try and bring about a reconstruction. Unfortunately, while on the water the diamond market practically collapsed, which made it quite impossible to do anything at the time. While in South Africa I determined to visit and go over the mine, which I did in February, and spent the best part of two days there, going carefully over all the property, namely, mines, floors, buildings, and machinery, with the manager, Mr. Thomas Dilks, and was quite satisfied that if a reasonable price could be obtained for the diamonds, and an up-to-date crushing plant completed, also an aerial gear erected at the mine for hoisting the blue ground, stone, etc., instead of the present incline, the mine should certainly be made to pay good dividends. By introducing this haulage system it would enable any part of the mine to be worked; the richest ground would then naturally be operated on. One great advantage on this property is the cheap price of coal delivered, and also the economical handling of the water from the dam, constructed by the company for steam boilers and washing ground."

Lately large sums have been expended in connection with the installation of a complete new and up-to-date plant suitable for the direct treatment of the blue ground from the mine and an aerial gear sufficient to handle 2,000 loads per diem. With the present price of diamonds the prophecies above in regard to this mine seem about to be more than fulfilled.

DIVIDEND PROSPECTS FOR THE HALF YEAR.

A Satisfactory Aggregate Expected—Gold Total to Date, £550,364.

The first of the dividend declarations for the half-year ended with June 30th have begun to come in, and, although it is at the moment impossible to predict with any degree of accuracy what the total will be, it can at least be anticipated that both the aggregate and individual sums distributed will compare favourably with those announced in June of last year.

Total to Date.

For the first six months of 1912 Rand gold mines distributed £3,744,282, and it certainly looks as if the sum total for the first half of this year will exceed that amount. It may indeed top the record of the January-June period of 1910, when £4,351,467 were paid out amongst shareholders. So far dividends in respect of this year's operations on the Witwatersrand and the Barberton and Lydenburg districts have amounted to £550,364, of which £399,032 has been paid out by Rand gold mines and £151,332 by properties in the outside districts. The amounts so far distributed have been:—

Witwatersrand—	
Durban Roodepoort	£12,500
Ferreira Deep	245,000
Jumpers	5,000
Nourse Mines	82,782
Wolhuter	53,750
Barberton—	
Sheba	13,487
Lydenburg—	
Glynn's Lydenburg	17,000
Transvaal Gold Mining Estates	120,845

The sums paid out by these concerns for the corresponding period of last year were:—

Witwatersrand—	
Durban Roodepoort	£12,500
Ferreira Deep	182,000
Jumpers	—
Nourse Mines	82,782
Wolhuter	75,250
Barberton—	
Sheba	26,974
Lydenburg—	
Glynn's Lydenburg	17,000
Transvaal Gold Mining Estates	75,528
	£472,034

It will be seen, then, that in so far as these companies are concerned, the advantage lies with this half-year's declarations to the extent of £78,330.

Chairmen's Anticipations.

As to the announcements to be made in the course of the next week or so for those companies with financial years ending with the end of the calendar year and declaring dividends in June and December, we prefer to await actual announcements rather than attempt forecasts. In one or two instances, however, chairmen at company meetings have made statements regarding forthcoming distributions which are here worthy of repetition. At the Modderfontein B. meeting, for instance, Mr. Schumacher said: "We expect to declare in a few days a dividend of 20 per cent., or 4s. per share, for the half-year ending the 30th of June. The distribution is a conservative one, and will enable us to strengthen further our already strong cash position." At the Rose Deep foregathering Mr. Eckstein remarked: "I think we shall be in a position again to raise our next dividend a little." At the Robinson meeting Mr. Boyd stated that the policy of acquiring other interests rendered the reduction of the dividend advisable, and he stated that the dividend for the first half of this year will be restricted to 8s. per share. The Meyer and Charlton dividend, Mr. Nathan announced, would be of 30 per cent., whilst at the Brakpan Mines meeting Mr. Honnold "ventured to say" that he saw no reason for "anticipating less than 20 per cent. in June." References to dividends were also made at the Crown Mines and Geldenhuis Deep and other meetings. With these brief remarks we will leave actual totals for discussion in our issue of next week or the week after. We repeat that we feel confident that the aggregate for the Transvaal gold mines will compare very favourably with that announced for the first six months of 1912.

Transvaal G M. Estates

The following are the particulars of this company's output for the month of May, 1913:—Central Mines: Tons crushed, 13,100, yielding 8,921·596 fine ozs. Elandsdrift Mine: Tons crushed, 630, yielding 685·586 fine ozs. Vaalhoek Mine: Tons crushed, 1,570, yielding 516·611 fine ozs. Estimated value of month's output, £42,471; estimated profit for the month, £26,021.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of May, 1913:—Tons crushed, 3,145, yielding 1,566 fine ozs; estimated value of month's output, £6,513; estimated profit for the month, £2,575. Note: Tube mill closed down half month for repairs.

THE ELECTRIC SMELTING OF TIN—II.

A Review of Present Electrical Processes of Reduction.

[By a Special Correspondent.]

THE ELECTRICAL EQUIPMENT.

Current for the experiment under review was obtained from a Diesel engine plant supplying power for a tin mining concern; the condition was that no disturbance or greater fluctuation should be caused which might endanger the regular working of the pumps in the mine. The electric-power supply was three-phase, 50 cycles, 650-675 volts. To meet this requirement a Berry three-phase transformer, oil-cooler was inatalled, receiving constantly 660 volts on the primary side, in atar connection, with only lightning arrester and main awitch on the line; the secondary side, which was also in atar connection with earthed neutral, had four tappings capable of giving either 30 volts, 40 volts, 50 volts or 60 volts. The terminals ended in copper busbara on a slate panel, provided with heavy copper acrew plugs for obtaining the desired combinations. Each phase on the secondary side was provided with an ammeter : a voltmeter, with a change-over switch served all three linea, while the recording and indicating watt-meters were on the primary side. The busbars were connected with the furnace electrodes by means of four flexible cablea of suitable size arranged so aa to give the least possible induction. As, however, the current was as high aa about 2,500 amp., a certain drop in power factor was inevitable; on the average this was about 0.90. During the whole period no disturbance whatever was caused by the electrical gear, though one or two thunderstorms were experienced; the distance between power houae and smelting shop was about 600 yards.

THE FURNACE.

The furnace used is a shaft furnace of special design. Owing to pending patent applications a detailed descriptoin of this, as well as of the details of the actual smelting process employed, will have to be deferred. One of the principal features in an ordinary reverbatory tin furnace, is that the metal, like mercury will percolate into the lining and brick work in large quantities and remain lodged there until the furnace is broken up. In a large plant with a number of furnaces, this means a locking up of a considerable capital for a long period, which naturally is objectionable. This is successfully avoided in the new design of the electric-furnace, where only a minimum quantity of metal is withheld, all the metal being drawn off as soon as it is formed. Three electrodes of carbon 8in. x 8in. square and 4ft. 6in. long, cooled by water jackets, were used. The electrodes were held by means of gripping holders extending ovor half the electrodes and moved upwards as the ends are worn off. The holders were suspended by means of flexible steel rope, and worm-gear winches, permitting of a fine adjustment. No direct arc was perimtted to be formed as this caused a great variation of the yield and the working of the furnace. The charge formed a cone-shaped heap in tho hearth, covering the reacting zone, permitting the electrodes to "burn free," forming a small space filled with incandescent gas round the ends, which acted as a resistanee, in which the reaction took place. This is, as is well known among furnace men, the only efficient way of properly working a furnace. Arrangement was made to prevent the escape of volatilized metal; only about 0·5 per cent. or less of tin found its way out of the furnace. Tapholes on different levels were provided for drawing off metal and slag separately. Sometimes the slaghole became frozen up with a hard slag crust, especially if the ore is rich in iron, all of which went into the slag. In that ease, a small auxiliary electrode was used for burning the taphole open again, though it must be admitted that an oxy-acetylene jet would be even more handy.

THE SMELTING PROCESS.

At the start of a campaign, which usually lasted ten to twelve days, on acoount of the experimental nature of the trials (though there was no difficulty in keeping the furnace working for months in succession), the empty furnace was first pre-heated for about four-six hours by means of a small wood and coke fire, in order to prevent cracks in the brick work. In subsequent smelts, this was entirely dispensed with, since the lining had properly set. A charge of about 14 kg. of culm for each 100 kg. of ore, depending somewhat on the nature of the ore, was gradually filled in, while a current of about 1000 amp. per phase, at 60 volts, was turned on. As the reaction commenced, the volts were lowered gradually at the working condition of 40 volts and 2500 amp., which was steadily maintained during the whole run. Only on special occasions with certain ores was 30 volts used. The current fluctuated considerably at the beginning, as tho cold charge was being thrown in, but as soon as the electrodes had commenced to "burn free" properly, the fluctuation ceased. Half an hour after the first charge the first tapping of metal could take place, while the first slag was drawn after the furnace had been in proper working order for a couple of hours. The appearance of the slag rendered it possible to the experienced eye to judge if the charge was of the right composition or not, if of a glass-like, dark brownish green colour, and freely leaving the taphole, the charge was right; if sluggish and light brown, it had to be altered. After a few hours' run, certain reagents were added at regular intervals; this successfully prevented the formation of "hardhead," causing the sulphides and arsenides of iron to enter into the slag instead of alloying with the tin. The result was that the metal, as it left the taphole of the furnace, was about 98 per cent. pure, if the right blend of ore, not too much contaminated with impurities, was used. In one campaign ordinary Bolivian ore alone, with only 49·9 per cent. tin., and about 15 per cent. of iron, was smelted for about ten days and yielded over 92 per cent. totally, on some days even 97 per cent. of the metallic tin from the ore. The liquid metal was accumulated in the usual way in large pots of wrought iron, heated from underneath and the sides. By means of an air-pump, air was blown through the metal through a perforated iron pipe, whereafter the metal was ladled into a second tank to set properly. With this simple operation a metal of 99·75 per cent. purity, and even more, was obtained, though this is well up to commercial standard. The metal was then poured into ingots of about 28 lbs. weight, branded and stored in the usual way.

OUTPUT, POWER CONSUMPTION AND LOSS IN SLAG

All three of these factors were found to be in close relation to each other. It was thus found that a slag containing as low as 0·25 per cent. of metallic tin could be easily produced, but to do this in one operation proved to be less economical with the prevailing power price. The output was only about 6 to 8 cwt. per day, and the power consumption correspondingly high, or about 3,000 kw.-hours per ton of metal. Going to the other extreme, the operation could be so conducted, by altering the composition of the charge, that a slag containing 17 per cent. to 19 per cent. of tin was produced. In that case the output increased to 1 ton 11 cwt. per day, with a power consumption of 1360 kw-hours per ton of metal. As only one furnace was provided for, this manner could not be considered a commercial one, with such high losses of tin in the slag, although the slag could be treated again separately. It was found most economical under the prevailing conditions to operate the furnace so as to obtain a metallurgical yield of 96 per cent. to 98 per cent., with a higher power of consumption. The following weekly report for the week July 28 to August 4 is fairly typical:

Ore used: 20,056 lbs. at 57 per cent.	12,003 lbs. metal.
Scrap metal and charge refuse	2,324 lbs. metal.
	14,327 lbs. metal.

Tin produced, 14,170 lbs.
Net yield, 98·75 per cent.
Total number of kw.-hours, 13,935.
To be deducted: for slag treatment (experiment) 678; for preparing furnace, etc., 500.
Electrode consumption, 28 lbs. per ton of metal.

It should be noted that the figure for the power consumption was only approximately 1,800 kw.-hours per ton.

ANSWERS TO CORRESPONDENTS.

'H. S." (Capetown).—Your questions are answered in the report of the meeting that appeared in our issue of May 24.

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ERRORS IN SAMPLING AND ASSAYING.

The Question of Eliminating High Assays—Opinions of "I.M.M." Members.

As we anticipated, the paper read by Mr. Franklin White before the Institution of Mining and Metallurgy entitled "Errors in Sampling and Assaying Ores, due to the presence of coarse gold," read before a recent meeting of the Institution of Mining and Metallurgy in London, has attracted considerable attention and elicited much valuable discussion. The paper has, of course, a much greater interest to mining men engaged in work in mining fields like Southern Rhodesia, West Africa, and the outlying districts of the Transvaal than the auriferous conglomerates of the Witwatersrand, but its general importance in so far as all gold mining fields are concerned is not to be denied. Discrepancies between value established by sampling and assaying and actual mill and cyanide recovery are common incidents in mining and until metallurgical and assay practices have been rendered absolutely perfect and man is able to eliminate all factors of chance and error in the sampling of ores these discrepancies will continue. Such an Utopian state of affairs is, of course, impossible, or at any rate impracticable. But that is no reason why mining men and metallurgists should not strive to reduce these errors to a minimum, and Mr. White's paper has certainly stimulated interest that should be productive of valuable result. One of the most important points brought out in Mr. White's contribution was in regard to difficulties in connection with low grade ores and not the very rich ones. It has been the experience of large numbers of men who have had to deal with ores of this nature that they sometimes come across one assay in a large number made up of the same sample which gives apparently too high a result, not from contamination from outside but on account of a particle of gold present in the sample. On this point Mr. H. F. Marriott made one or two interesting remarks during the discussion of the paper. He said the real question was: When should a high assay result be considered as normal or otherwise? He would quote them an instance which, perhaps, had some bearing on the subject. He once had to sample a low-grade mine which consisted of a number of intersecting veins. He took about 400 samples, and they nearly all returned about 3 or 4 dwts. Amongst these samples, however, there were four which were extremely high in gold contents, going some hundreds of ounces to the ton. The inclusion of these with the remainder made all the difference between profit and loss in the estimated result. Eventually the mine produced on working very much the same result as was indicated by the high assays. He always contended that, if the work were done properly, and the samples were taken in sufficient quantity, a high assay had to be taken into account. Mr. G. T. Holloway in the course of his remarks spoke of errors resulting from attempts to achieve too many assays in one day, and we find ourselves in complete agreement with him on this point. He remarked:—

> The title of the paper referred only to gold, but it might be taken to cover any ore or product containing free metallic particles which could not be crushed to powder, such as ores containing native copper or silver, and waste products such as mint or jeweller's sweepings, lead and tin drosses and skimmings, etc. As regards the direct fire assay, the largest amount which could be used might be taken as 100 grm. or, say, 3 oz. So small a sample could not be representative except by accident, however carefully a material containing metallics might be sampled, and this applied to both rich and poor ores—perhaps even more to the latter. In his opinion, the only way to deal with them was to crush down and prepare a large sample, at least ten times as much as could be used for a fire-assay, whereby the sampling error would be minimised or, if enough were taken, eliminated. The sample should be panned down so that a rough concentrate carrying the whole of the metallics was removed. The whole of this concentrate should be potted down and the result of its assay and that of the ordinary fire-assay, on an aliquot portion of the tailings from the panning, should be calculated out to obtain the total gold contents. By this method, which he used because he thought it not merely the best but actually the only reliable one, all errors attributable to sampling could be done away with by working on a large enough sample. Regarding the question of crushing, he would recommend fine crushing. The sample should not be sifted before panning, and the tailings from the panning need not be sifted if properly ground. Any particles of gold were more likely to be rolled out like pencils or flattened like pancakes than to be ground to powder, while some would be rough and would cling to a sieve like shrimps. If sifted, it would be difficult to remove these particles from the sieve, and not only that sample, but the next, might be spoiled. The adoption of this method of assaying would reduce the number of results reported by the assayer, but, as Mr. White had said, increased efficiency would justify reduction in output. The speaker thought that an assayer on a gold mine who was often expected to report 100 assays per diem (although he did not believe anyone could do so efficiently) could not do more than, say, ten by the suggested method, but they would be ten reliable results instead of one hundred doubtful figures. It was, of course, difficult to decide how to deal with the erratic results obtained by direct assay of such troublesome ores, but it appeared to him that, if direct assaying were adopted, a large number of assays should be made and the mean result taken.

Mr. Goodchild contributed some remarks from which we quote as under:—

> Coming, then, to the practical matter of valuing ore containing coarse gold sporadically distributed, it seems to me that, for cases similar to that dealt with in the paper, a combination of panning with the fire assay affords a simple, economical and practical method of surmounting the difficulty. Modern laboratory facilities enable comparatively large samples to be ground moderately fine without incurring undue cost. Panning, say, a 10lb. sample ground to pass a 40-mesh sieve, need not be a lengthy or costly operation, and it can generally be relied on to partially separate without loss the coarser gold that gives the trouble in the preparation of the necessarily small sample required for the fire assay. The "colours" separated in the pan can easily be refined by cupellation and parted, while the residue from panning may be dried and re-ground if necessary, sampled, and fire assayed. Given suitable facilities, the drying of the pan tails need not be either troublesome or costly. Most mines nowadays use compressed air, and it is quite a simple matter to make a laboratory filter-press out of some piping and pipe flanges and some small sundries that are usually available on most gold mines. With the aid of a press the whole of the slimes can be easily handled without risk of loss, and the drying problem becomes quite an easy one. Handled in this way, the panning method in combination with the fire assay presents many advantages over the method of dry screening for metallics commonly practised by assayers. Although Mr. White speaks of errors in assaying in the title of his paper, the errors dealt with by Mr. White seem to me to be essentially sampling errors rather than errors in actual assaying. Mr. White's description of his ore suggests something of the "banded ironstone" type. These deposits not infrequently contain a very high percentage of sesquioxide of iron, and some of the minor differences in the assays might easily have been due to the tendency of ferruginous slags to carry gold into the slag, if the fusions are not very carefully conducted.

MINING MEN AND MATTERS.

Mr. E. H. Cunningham Craig, F.G.S., the well-known oil expert who is to report on the oil possibilities of the Union, has arrived at Port Elizabeth and is visiting Ceres next month.

* * * *

Mr. Lowenstein has been appointed buyer to the Neumann group, in place of Mr. A. Dowdle, resigned.

* * * *

Mr. J. Andrew Cohen, the chairman of the Ehrlich group of companies, goes to Europe on a four months' business trip on the 26th inst.

The trustees of the late Sir Julius C. Wernber have voted £1,500 to the fund which Mr. Austen Chamberlain is raising for the extension of the London School of Tropical Medicine.

* * * *

The Compagnie Française de Banque et de Mines has been absorbed by the Crédit Mobilier Français, 30 and 32, Rue Taitbout, Paris and Johannesburg, to whom the Paris representation of the Rand Mines group has been transferred.

* * * *

Mr. Hugh Mitchell, the new general manager of the Langlaagte Estate, was formerly underground manager of the Cinderella. He is a nephew of Mr. F. H. P. Creswell, M.L.A.

POSITION AND PROSPECTS OF THE CROWN MINES.

Chairman's Lucid and Informing Review—Ore Reserves and Recent Developments—Milling Representative Ore—Excellent Outlook.

Mr. Samuel Evans followed his wonted custom at the annual meeting of the Crown Mines last week by making a lengthy and detailed statement disclosing the position and prospects of the mine up to date. *Inter alia*, he said:—

As you know, in order to reach the present position we have had to overcome a number of serious difficulties and to face disappointments; our capital expenditure has been heavier than we had anticipated; the supply of unskilled labour has throughout been much below our requirements, and the Rand Mines Power Supply Company is not even yet in a position to give us all the electric power and compressed air we want. However, as regards the essential features of the programme which has been carried out on the Crown Mines your directors are satisfied that they acted wisely in agreeing to and in supporting, in the face of considerable criticism, the plans formulated by Mr. Webber and Mr. Warriner at the beginning of 1909. I should add that the policy we have been pursuing has had the strong and hearty support of Mr. Stuart Martin, who has been the consulting engineer since Mr. Webber's departure, rather more than two years ago. Having regard to all the circumstances, I consider that I am fully justified when I say that the engineers responsible for what has been done on the Crown Mines can compare their original recommendations and the task accomplished with a pride and a satisfaction rarely exceeded in the history of undertakings of such magnitude. I have brought up to date, for the purpose of submitting to you to-day, the comparison that I made use of at our last annual meeting. This table will enable shareholders to see at a glance where the actual results obtained since the amalgamation differ from the forecasts on which the amalgamation was based and from the previous records of the companies forming the Crown Mines. In order to make the comparison a fair one, I have throughout excluded the profits made from accumulated slimes and the treatment of old dumps.

	Average results of five years ending 31/12/08.	Estimates framed in Jan., 1909, of position after completion amalgamation programme.	Actual Results.			
			1910.	1911.	1912.	First five months, 1913.
Tons mined per month	102,500	195,294	136,549	152,599	181,942	220,901
Tons milled per month	91,425	166,000	126,166	134,875	160,058	190,720
Percentage sorted	10.8	15	8.3	11.7	11.9	13.6
Value yield per month	£176,077	247,500	211,162	237,018	254,248	287,270
Working costs per month	£90,077	131,000	114,402	130,043	146,414	162,687
Profits per month	£86,000	116,500	96,760	106,975	107,834	124,583
Per ton milled:						
Yield	38/ 7	29/10	33/5.7	35/ 1.7	31/9.2	30/1.5
Working costs	19/ 8	15/ 9	18/1.6	19/ 3.4	18/3.5	17/0.7
Profits	18/11	14/ 1	15/4.1	15/10.3	13/5.7	13/0.8

This statement shows that we are making headway; less rapidly, it is true, than we at one time expected; but we are moving steadily forward, and we have not yet come to a standstill by any means. In fact, we have a great deal of room for further advancement. As far as the underground and surface conditions are concerned, we are to-day in a position to mine on the day shift and to haul and handle on the surface something like 3,400,000 tons of ore per annum, and our reduction plants have sufficient capacity to treat yearly over two and three-quarter million tons. That is, there is a margin over what we did last year of 1,200,000 mining tons and over 850,000 milling tons.

IMPORTANT FACTORS.

The determining factors so far as our present operations are concerned are: In the first place, the supply of unskilled labour, and secondly, but to a lesser extent, the supply of electric power and compressed air. As regards the second point, we have good grounds for believing that most of our troubles will be over before the end of this year, and that the Rand Mines Power Supply Company will be in a position to meet all our demands. The labour position is the least satisfactory feature of the situation. Even in that direction a great deal has been accomplished recently. The industry made a distinctly forward step when all the groups excepting one agreed to the formation of the Native Labour Recruiting Corporation. This has led to a more equitable distribution of the labour available, and is preventing money being wasted on competitive recruiting. We had in our employ last year an average of 12,950 natives, as compared with 12,605 in 1911. On the 20th of March this year we had in our compounds 15,317 Kaffirs, which is the maximum number we have had on our books. Since, there has been a net wastage of about 1,200, and this is having an adverse effect on our output. Last month we were particularly unfortunate in this respect. We lost tramming and shovelling boys, which we were unable to replace, from the Robinson Central Deep and from the best section in the Langlaagte Deep, with the result that a not inconsiderable quantity of high grade rock which had been broken had to be left in the stopes for the time being. We are, I may add, making every endeavour to economise Kaffirs by extending the use of labour-saving devices. What is being accomplished in this respect is well illustrated by the progress which we have made in replacing hand labour by small machines for the purpose of breaking rock in narrow stopes. I will give you the figures of the tonnage broken by small machines in our mines last April and in the corresponding month of the previous three years: April, 1910, 1,568 tons; April, 1911, 11,870 tons; April, 1912, 32,561 tons; April, 1913, 54,816 tons. This movement would, I believe, have been accelerated, not only in the case of our company but on most of the mines of the Rand, had it not been for the fact that under the existing schedules natives can earn considerably more by hammer than by machine work. The importance of inducing natives who are now doing hand drilling to take up machine work is very great, and it has been estimated that if all the mines of the Rand could break with machines the rock which is now being broken by hand there would be a saving of over thirty thousand boys.

WORKING COSTS.

Working costs are undoubtedly high. Last year they amounted to 18s. 3.5d. per ton as compared with 16s. (average of the separate companies) in 1908, and 15s. 9d., the estimate framed by Mr. Webber in January, 1909. For the first five months of this year they averaged 17s. 0.7d. per ton, or 1s. 3.7d. higher than the estimate formed prior to the amalgamation. Now, I have two observations to make on these figures. In the first place, there is still room for reduction. It must be remembered that of the compressed air used in the mine on day shift last year we manufactured over 40 per cent. ourselves at a price which is above that of which the Power Company will in due course be supplying it to us. We are also using steam to a large extent, which involves extra expense as compared with the charges which we shall have to meet when the electrification of our plants has been completed. Moreover, the centralised system has only been in operation since August last, and there still remains to be adjusted many details which will help to reduce the expenses. Further, the costs will automatically come down when we are employing our plants to something approaching their actual capacity. In the second place, I would point out that we have to face to-day a number of charges which were not contemplated at the time the estimates were framed rather more than four years ago. This point has been dealt with in some detail in Mr. Warriner's paper. He compared June, 1909, with January this year. The costs per ton were 15s. 7.2d. in June, 1909, and 16s. 11.6d. last January. Mr. Warriner shows that in January there were savings on the workshops, transport, crushing, sorting, reduction, and pumping plants amounting in the aggregate to 1s. 8d. per ton milled. He further shows that there were increases in other items amounting to 3s. 9.9d. per ton milled owing to stoping narrower widths, the introduction of the eight-hour day underground, and other charges which had not to be met in ore reserves.

I have left till the last the all-important question of ore reserves and the disclosures resulting from recent development operations. I may preface my remarks on this subject with a few details as to the rate at which our mining ground is being exhausted. The number of claims worked out during the year was twenty-seven, or approximately forty acres. This applies to the Main Reef Leader and the South Reef only, and there is a good deal of payable ore, such as pillars and portions of the main reef, still left in these claims. At the beginning of this year the intact portions of our reef-bearing ground measured slightly over one thousand claims, equal to 4.36 square miles, or 2,792 acres; in addition to which we have reclaimable ore in the Crown Reef and in other sections which are shown on the plan as having been worked out. I may mention that during the three years ended December last we mined nearly 1,300,000 tons of payable ore from sources other than the reserves. As I have stated at previous meetings, we were obliged while the amalgamation programme was under way to take a higher proportion of ore from No. 1 shaft and the eastern end generally than was justifiable, having regard to the value of the total ore developed. In fact, while the transition stage lasted we had no choice but to stope from the areas opened up, and to use to their fullest capacity the shafts, haulage ways, plants, and appliances existing in the middle of 1909. You will be glad to hear that we are now in a position to mine ore which is fairly repre sentative of the ore reserves, and that is what we are doing. For more than a year we have not taken an undue proportion of rock from the Robinson Central Deep section. The ore developed in that area equals 19 per cent. of the total reserves, and that is the proportion which the ore stoped in the Robinson Central Deep bears to the total ore mined last year. We are still mining a slightly larger proportion of ore from the Crown Deep and Crown Reef areas than would be theoretically correct, but the difference amounts to only 2 per cent. on the total ore mined in the past five months, and is therefore of no practical importance. Taking the work done last year and during the past five months, this is how the percentage of ore mined from the eastern and western sections compares with the ore reserves in these areas :—

	Ore Reserves. Dec. 31st, 1912.	Ore Mined,	
		1912.	1913, Jan. to May.
	p.c.	p.c.	p.c.
Eastern Section, including Robinson Central Deep, Crown Deep and Crown Reef ...	58	62	60
Western Section, including Langlaagte Deep, Langlaagte Royal, and Paarl Central ...	42	38	40

NEW ORE.

I am sure shareholders will agree with me in considering the position a satisfactory one, but, of course, we must not lose sight of the fact that as development increases the ore reserves in the Robinson Central Deep will continue to diminish gradually in proportion to the ore reserves in the rest of the property. This, however, need not cause anxiety to shareholders having regard to the satisfactory character of the ore which has recently been opened up in all the lowest levels in the central and western sections of the mine, and to which I shall presently refer.

EXCELLENT DEVELOPMENT.

A comparison of these figures (the ore reserve estimates of 1909) with the actual position at the end of last year shows that as regards development we have done a good deal better than was anticipated four years ago, and you will, I am sure, be pleased to hear that recent disclosures in depth are of a most encouraging character. This remark is particularly applicable to the Langlaagte Deep Section. In that portion of our property we have recently developed close on half a million tons below the 11th level; practically all the ore exposed is payable, the reefs are wider and the values are higher than the average of the ore reserves above the 11th level. The position in the South Rand section is also very satisfactory, as all the development work done below and immediately above the 13th level more than maintains, both as regards width and values, the average of the Crown Deep levels opened up in the past few years. I may say that, taking the whole of the central and western portions of the Crown Mines the ore disclosed in the lowest levels is uniformly good and considerably better than the estimates framed prior to the amalgamation.. Under these circumstances, I have no hesitation in saying that the present outlook justifies shareholders in viewing with considerable satisfaction the position as far as our ore reserves and our future prospects are concerned.

THE OUTLOOK FOR MODDER B.

Increasing Profits—Coming Dividend—Recent Development Results.

Mr. R. W. Schumacher presided at the annual meeting of the Modder B. this week and dealt very fully and lucidly with the position and prospects of the company. *Inter alia*, he said:—

Our general development policy is to open up the mine rapidly on the present system of big blocks in order that we may obtain a more thorough knowledge of the property soon, and then, if things are satisfactory, crush on a larger scale than to-day. We have at present a large area of ground developed in the western section of the property, adjoining the new Modderfontein Company, which promises in itself to be a mine of considerable size and unusual richness. The lowest workings in this area, that is, the winzes below the second level, continue to expose ore of high grade, and some winzes are already below the plane of the future third level. Further to the east the third level, coming westwards from the main shaft, has for a long way been in unpayable ground, so it is most desirable that we should push downwards in order to find out more about the value of the reef. It is very satisfactory to note that a winze from this third level, situated almost due south of the main shaft, has latterly shown several decidedly payable assays. To the east of the main shaft the ground is broken, and as we were forced during 1912 by the scarcity of labour to press development in those sections of the mine where we were most certain of opening up payable ore, work was concentrated in the western section of the mine, and the eastern portion had to remain comparatively neglected. Latterly we have again been able to turn our attention to the eastern area, and last month, May, we were fortunate in encountering reef in a prospecting shaft only 286 feet below the surface, and 1,550 feet to the north-east of our present most easterly workings. This strike may prove of importance in so far as it helps us to locate the reef much quicker than would otherwise have been possible. The reef here, I must remind you, cannot be followed from the outcrop, as it is overlain by coal formation unconformable with the strata below. It is also known to be considerably faulted and to take a northerly turn towards the Rand-Klipfontein mine. The only other indications that we have of reef values in the large unexplored eastern portion of our mine are the results obtained in the Geduld workings that now almost adjoin our south-eastern boundary. The values exposed in these workins have been of very good grade. As far as crushing capacity is concerned, our general policy will be to feel our way slowly, and to increase gradually only as the mine becomes more opened up and development results remain satisfactory. We have, since starting milling operations, kept the cash position of the company strong, and we feel certain that we shall have the approval of shareholders if we continue to do this with the policy of gradual expansion in view. In the near future the contemplated capital expenditure amounts to about £60,000, about the same figure as the cash brought forward at the commencement of the current year. A portion of this sum is required for a new electric hoist, engine-room, etc., a further portion for additional married and single quarters, and most of the balance is provisionally set aside to cover the estimated cost of increasing in the near future the crushing capacity of the plant to 40,000 tons monthly. We intend, with your permission, to be free to utilise the funds, so far earmarked for repairs and renewals, in connection with the extension of the plant in the future, if thought desirable. I have now tried to make the whole position clear to you. Our property is of great extent, measuring 12,000 feet from east to west. It has been partially opened up with rapidity in spite of shortage of labour. We have already proved a large and rich mine in the western portion of our property; we know comparatively little about the eastern half, which is faulted in places, but there are favourable indications in various localities, each far from the other. The latest developments in the west give us no reason to expect a fall in profits as compared with last year, but you will remember that we have no close control over the output from month to month owing to the large size of the ore blocks and to variations in the value of the stope faces. Fluctuations in the monthly profits may, therefore, continue, and, as I mentioned last year, we shall make no expensive efforts to avoid them; our efforts will be concentrated on working the payable ore, avoiding the unpayable, and keeping broadly to the general average grade of the mine. There is no doubt that the general outlook is very bright, and if we can continue development work without hindrance a very considerable portion of our property may be roughly opened up during the next two or three years. I must add that we expect to declare in a few days a dividend of 20 per cent., or 4s. per share, for the half-year ending the 30th of June. The distribution is a conservative one, and will enable us to strengthen further our already strong cash position. I can also inform you that we expect a record profit for the past month of May.

It is notified that it is the intention of His Excellency the Governor-General to deproclaim as a public digging a certain piece of Government ground, situated on Section "A," Kaap Block, in the mining district of Barberton, Transvaal Province, in extent 1259 morgen.

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RECORD PROGRESS AT THE ROSE DEEP.

Increasing Dividends—Success of Amalgamation—Some Facts for Investors.

Mr. H. Eckstein's speech from the chair at the annual meeting of the Rose Deep this week was of unusual interest and importance. Having reviewed the improvement in the finances and working conditions at the mine during last year, he said:—

The improvement in the yield on the 1909 estimates is, in my opinion, largely due to cleaner mining and careful attention to the efficiency of the reduction plant. If due allowance is made for the unavoidable addition to working costs during the recent years, and if it is understood, on the other hand, that the old Rose Deep and Glen Deep Companies working as individual units could not have had the advantage of the compensating features to which I have just referred, then I say it may be claimed that the amalgamation has been an undoubted success. The policy of extracting ore from old workings in the north section of the Rose Deep, while it is accessible, has been successfully continued. 79,000 tons were obtained from this source last year, and it is hoped that considerable further tonnages will be won before this section has been depleted.

VALUABLE COMPARISONS.

I cannot deny myself the pleasure of putting before you some figures showing the mill tonnages, working costs and the net profit earned by the company during the last three years. They are as follows:—1910: Tonnage milled, 656,500; working costs, 18s. 10d.; net profit, £317,752. 1911: Tonnage milled, 695,100; working costs, 17s. 11d.; net profit, £342,832. 1912: Tonnage milled, 782,200; working costs, 17s. 5d.; net profit, £443,135, inclusive of £25,700 gold reserve. The results during the first four months of the current year compare as follows with those of the corresponding months of 1912: Mill tonnage, 1912, first four months, 253,800; mill tonnage, 1913, first four months, 271,130; working costs, 1912, monthly average for the same period, 17s. 10d. per ton; working costs, 1913, monthly average for the same period, 16s. 9d. per ton; working profit, 1912, for the four months, £134,195; working profit, 1913, for the four months, £150,976. These figures constitute a record of progress of which any company might well be proud. I might go even further, and say that they should go a long way towards attracting investors' attention to the possibilities of some of the old-established mines on these fields. During the recent summer months the reduction plants were run to their utmost capacity, the highest tonnage milled in any one month being little short of 70,000. We are advised that it would not be possible to maintain this tonnage during the winter months without seriously raising the slimes residues, as a low temperature always militates against an efficient treatment of the slimes in the time within which a proper treatment is assured in warmer weather. As, given a sufficient supply of labour and a smooth run, the mine is fully capable of supplying the mills at the rate of 70,000 tons per month, the board has recently decided to make a few additions and improvements to the slimes plant at the Rose section, involving an expenditure of about £6,500. It is estimated that this will enable 70,000 tons per month to be put through the mill all the year round, and every effort will be made to reach this figure. The additions should be completed at the end of this month. No further capital expenditure is in sight. Lest it should be feared that in view of the increasing crushing capacity the life of the mine will be shortened, I might state that I hope we have not reached bottom as regards working costs. Any further reductions should allow of our adding to the payable ore reserves certain tonnages of ore which could not have been classed as profitable a year or two ago. The supply of native labour to the mine has, during several months, been almost excessive. I mention this in case you should have misgivings on account of the recent announcement that no further tropical natives will be allowed to be recruited. We had an average of 638 of these boys working last year, and unless, in addition to the probable gradual loss of these boys, there is a serious reduction in the number of our other labour force, I believe that we shall experience little inconvenience in this connection. Gentlemen, I am glad to say that though last year's results have been very satisfactory, indications point to a possible further advance during the current year, and I think that we shall be in a position again to raise our next dividend a little.

BETTER PROSPECTS FOR BANTJES.

Normal Profits Now Anticipated—Dividend Despite Recent Set-Back.

On the whole the speech made by Mr. H. Eckstein at the annual meeting of the Bantjes last week was of a reassuring nature. Having reviewed the report and accounts for last year, he said, *inter alia*:—

"During the first four months of the current year there has been a marked increase in the development footage, and it is reasonable to expect that this will in due course be reflected in the development tonnage. Such tonnage as has entered into the valuation of the payable ore reserves as a result of the footage done in reef formation last year has been fully up to average value in respect of both south reef and leader. The ore reserves have been carefully recalculated at the end of last year, and the knowledge gained from actual stoping operations has, of course, much facilitated a valuation which should be fully borne out in working results. The payable reserves now stand at 840,800 tons, value 7 dwts., showing a slight reduction in both tonnage and value, as compared with the previous year's estimate. As you are aware, the idea is to concentrate all underground operations to the central shaft, that is to say, to lay out the mine in such a way as to be able to transport with ease ore from all sections of the mine to this shaft. The position is to-day as follows: The 6th main concentrating level has now been connected between the central and west shafts, which latter has been stopped just below the 6th level and has now been converted into an ore pass. The bulk of the ore stoped west of the main dyke, which lies midway between the central and west shafts, is now being transported to the central shaft by means of animal traction, which has been successfully put to work on the 6th level haulage drive. The 10th level will be the next main haulage drive to connect the central and west shafts; it is already well under way, and will in due course meet an ore pass which will be put down from near the foot of the west incline. Similar arrangements will be made on the 15th level.

RESULTS OF IMPROVEMENTS.

As regards the east shaft, which has been stopped 100 feet below the 10th level, this will also not be sunk further. This shaft will likewise be connected with the central shaft on the 10th level drive, which is advancing from the central shaft eastwards. An ore pass will be put down from the foot of the east incline to connect with the next main concentrating level (the 15th) which will shortly be started from the central shaft. Before very long all water will be concentrated on the central shaft and all other pumps shut down. Arrangements are also being made for ventilating the lower levels of the central shaft. Generally speaking, the work which has been, and which is going to be, done will place the mine in a splendid position for opening up big areas in depth, and for handling the ore required to feed the mill. The rate of progress of the scheme which I have outlined will naturally be governed by the strength of the labour force at our disposal and its efficiency.

LABOUR AND MONTHLY PROFITS.

The working profits of the first quarter of 1913 are indicative of a maintenance of last year's results, in fact they were slightly higher than those for the corresponding quarter of 1912. Unfortunately we had a set-back in April, which I feel confident was entirely of a temporary nature. Given sufficient labour there is no reason to think that our monthly profits will not now continue to be normal. We are naturally striving for still better results, and every effort will be made to maintain, or further increase, the high tonnages put through the mill during March and April last. It is particularly interesting to note that the proportion of Main Reef Leader included in the mill tonnage shows a steady increase. The cost of the new winder, to which I referred previously, is estimated at £15,346. This is the only item of capital expenditure authorised at present. I may add that notwithstanding the disappointing profit for April last, we shall be in a position to declare a dividend shortly for the first half of this year."

JOHN E. CONNELLY, C.E., M.S.A. (Lon'.),
Civil Engineer and Architect,
18, Norwich Union Bldgs., Fox St., Johannesburg.
Steel Construction and Armoured Concrete Work Specialities.
Prints of all descriptions with expedition
Compiler of and Depôt for **Connelly's "Slime Pulp Tables,"**
Essential to all Cyanide Workers.

MAY GOLD PRODUCTION ANALYSED.

Another Record—Increase from Outside Districts—Randfontein Central's Position.

The gold production of the Transvaal for May was declared by the Chamber of Mines on Wednesday to be 794,306 ozs. of fine gold, of the value of £3,373,998, which is an increase of 9,332 ozs., value £39,640, on the April return. The output creates a new record by 3,754 ozs., value £15,948, the previous best return being made for last March. The chief factor in the creation of the new record, as was the case in March, comes from outside districts from the inclusion of gold won in April and which was not included in that month's declaration. The increase is not in proportion to the extra working day in the month of May compared with April, and neither the average daily production nor the average daily group profit compare favourable with the previous month. The Witwatersrand output of 761,349 ozs., value £3,234,004, shows an increase over April of 5,491 ozs., value £23,322, and is better than the previous record established in March by 1,025 ozs., value £4,352, but if there had been the same relative daily return as was accomplished for April the record would have been some £80,000 higher. One of the causes which has helped to establish the new record is the increase made by Randfontein Central. Outside districts with a return of 32,957 ozs., value £139,994, have reached their high-water mark and show an increase of 3,841 ozs., value £16,318. The native labour returns, according to the Native Labour Association figures, show that the efflux of labour has set in very severely and is greater than for any month for the last three years. Usually the ebb in the labour fluctuation does not begin till May, but this year it set in in April, and the wastage for May of 8,052 is extremely heavy. It brings the labour complement on gold mines to the lowest number recorded this year. The following are the salient figures for the month:—

Total output	794,306 ozs.
Value	£3,373,998
Increase	9,332 ozs.
Value	£39,640
Rand output	761,349 ozs.
Value	£3,234,004
Increase	5,491 ozs.
Value	£23,322
Outside districts	32,957 ozs.
Value	£139,994
Increase	3,841 ozs.
Value	£16,318
Total stamps	10,102
Increase	56
Rand	9,562
Increase	32
Outside districts	540
Increase	24
Tubes	290

THE LABOUR POSITION.

There is a decrease for May of 8,026, according to the W.N.L.A. figures, compared with April, which was in itself 1,680 short of the March maximum, in the total employed on gold, coal and diamond mines. There is a decrease on gold mines of 7,780, and an increase on coal mines of 9, while diamond mines decreased their complement by 281. The figures for the past three months of the numbers employed by members of the W.N.L.A. at the last day of each month read:—

	March.	April.	May.
Gold mines	207,733	205,424	197,644
Coal mines	9,009	9,053	9,062
Diamond mines ..	15,041	15,626	15,345
Totals	231,783	230,103	222,051

THE STAMP POSITION.

The stamp position for the whole of the Transvaal shows an increase of 56, compared with April. The Rand returns an increase of 32, and outside districts an increase of 24. The number of tube mills in operation on the Rand were 281, and also nine in outside districts. The details of the changes are:—Rand: Increases: City and Suburban, 2; Ferreira Deep, 5; Knight Central, 10; Robinson Deep, 20; Roodepoort United, 10; total, 47. Decreases: Cinderella, 10; Jumpers-cum-Treasury, 5; total, 15. Net increase, 32. Outside districts: Increases: Sheba-Rosetta (re-entrant), 20; Miscellaneous, 4; total, 24. Total increase, 56.

THE FIRST DOZEN COMPANIES.

The mines comprising the twelve leading producers show one alteration compared with April. Knights Deep, which was excluded in the April list by the Simmer and Jack, now re-enters and takes up the eleventh position, Simmer and Jack dropping out. In the order of the highest individual contribution, Randfontein Central displaces Crown Mines for the largest producer. Robinson Deep goes up from eleventh, as it was in April, to ninth for May. City Deep drops from ninth to tenth and Nourse Mines becomes twelfth on the list. The Ferreira Deep makes the excellent profit of £126,213. The following are the details of production:—

	Stamps.	Tube Mills	Tons Crushed.	Value.
Randfontein Central	865	29	266,887	£292,108
Crown Mines	660	25	237,580	286,433
East Rand Proprietary ...	820	25	202,756	258,419
Ferreira Deep	255	7	58,130	126,213
Robinson	250	6	62,600	107,259
New Modderfontein	180	7	52,250	98,747
Rose Deep	300	7	69,830	93,293
Geldenhuis Deep	300	7	60,000	88,807
Robinson Deep	180	10	64,000	84,993
City Deep	150	9	42,300	82,695
Knights Deep	400	9	110,700	81,119
Nourse Mines	260	7	52,400	81,115
Totals	4620	148	1,279,433	£1,681,201

GROUP PROFITS.

The following are the profits returned for March, April and May by the mines controlled by the different groups:—

	March.	April.	May.
Rand Mines (Eckstein) ...	£255,230	£230,259	£244,645
Rand Mines (Subsidiaries)	280,177	279,065	272,108
Gold Fields group	110,756	111,229	101,283
Robinson group	96,588	95,221	99,680
East Rand Proprietary ...	95,020	95,204	95,014
Barnato group	81,152	82,250	81,949
General Mining group ...	63,830	64,776	74,906
Neumann group	51,917	56,827	57,056
Cons. Mines Selection ...	30,116	24,305	27,067
Kleinfontein group	25,002	29,944	25,007
Goerz group	8,554	8,860	9,100
Totals	£1,098,332	£1,077,940	£1,087,815

INCREASES AND DECREASES.

The following returns of the May output have been filed with the Chamber of Mines. Increases and decreases compared with March are subjoined:—

The Witwatersrand.

	April.	May.	Inc	Dec.
	£	£	£	£
Aurora West .	18,851	19,531	680	—
Brakpan Mines	76,243	80,754	4,511	—
Bantjes	33,302	39,687	6,385	—
Cinderella	21,965	18,962	—	3,003
City and Suburban	51,028	52,489	1,461	—
City Deep	85,180	82,695	—	2,485
Consolidated Langlaagte ..	63,334	66,031	2,697	—
Consolidated Main Reef .	34,564	36,225	1,661	—
Crown Mines	297,073	286,433	—	10,640
Durban Roodepoort ..	15,173	15,423	250	—
Durban Deep	39,190	40,748	1,558	—
E.R.P.M.	253,959	258,419	4,460	—
Ferreira Deep ...	120,249	126,213	5,964	—
Geduld	18,286	18,783	497	—
Geldenhuis Deep ..	90,226	88,807	—	1,419
Ginsberg	20,007	21,018	1,011	—
Glencairn	16,838	16,430	—	408
Jumpers-cum-Treasury ...	11,380	11,532	152	—
Jupiter	43,616	44,363	747	—
Knight Central	28,719	27,895	—	824
Knights Deep	79,938	81,191	1,253	—
Langlaagte Estate ...	60,331	60,628	297	—
Luipaardsvlei Estate	18,694	18,992	298	—
Main Reef West	31,166	31,272	106	—
May Consolidated ...	14,922	14,183	—	739
Meyer and Charlton	33,820	33,672	—	148
Modder B.	61,227	66,927	5,700	—
New Goch	27,908	27,270	—	638
New Heriot	21,884	22,165	281	—
New Modder	100,879	98,747	—	2,132
New Primrose	36,233	36,437	204	—
New Reitfontein . ..	18,652	17,250	—	1,402
New Unified	16,651	16,048	—	603
New Kleinfontein	77,313	70,189	—	7,124
Nourse Mines	82,542	81,115	—	1,427
Princess	27,857	28,927	1,070	—
Randfontein Central	275,843	292,108	16,265	—
Robinson Deep	81,981	84,993	3,012	—
Robinson	103,186	107,259	4,073	—
Roodepoort United	25,240	26,939	1,699	—
Rose Deep	99,949	93,293	—	6,656
Simmer Deep	53,152	52,217	—	935
Simmer and Jack	80,605	73,783	—	6,822
Spes Bona	6,193	6,499	306	—
Van Ryn	55,497	55,807	310	—
Village Main Reef	71,268	65,525	—	5,743
Village Deep	74,051	77,389	3,338	—
Vogel Estates	16,566	15,903	—	663
West Rand Central	2,956	3,381	425	—
West Rand Consolidated ...	45,960	47,375	1,415	—
Witwatersrand	51,453	51,113	—	340
Witwatersrand Deep	64,663	68,002	3,339	—
Wolhuter	37,796	37,941	145	—
Miscellaneous	15,123	17,026	1,903	—
Outside Districts.				
Barratt	917	905	—	12
Ceylon Lydenburg	1,338	1,121	—	217
Glynns Lydenburg	5,739	6,652	913	—
Nigel	20,389	20,003	—	386
Quest	3,318	3,262	—	56
Sheba	13,499	13,771	272	—
Sheba-Rosetta	Nil.	1,716	1,716	—
Sub-Nigel	10,080	10,093	13	—
Trans. G.M.E.	40,413	43,773	3,360	—
Worcester	5,518	5,760	242	—
Miscellaneous	22,465	32,938	10,473	—

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value
Witwatersrand.				
Aurora West	14,925	80	4,598	£19,531
Bantjes Consolidated	30,700	100	9,343	39,687
Brakpan Mines	56,439	160	19,011	80,754
City Deep	42,200	150	19,468	82,695
City and Suburban	27,540	152	12,357	52,489
Cinderella Consolidated ...	16,120	70	4,464	18,962
Cons. Langlaagte Mines ...	49,850	100	15,545	66,031
Consolidated Main Reef ...	24,542	110	8,528	36,225
Crown Mines	196,000	660	67,432	286,433
Durban Roodepoort	14,321	90	3,631	15,423
Durban Rood. Deep	27,250	100	9,593	40,748
E.R.P.M.	170,000	820	60,837	258,419
Ferreira Deep	58,130	255	29,713	126,213
Geldenhuis Deep	60,000	300	20,901	88,007
Ginsberg	15,465	60	4,948	21,018
Glencairn Main Reef	22,050	160	3,868	16,430
Geduld Prop. Mines	14,550	50	4,422	18,783
*Jupiter ..	42,450	120	10,444	44,363
*Jumpers-cum Treasury	5,100	50	2,715	11,532
Knights Deep	110,700	400	19,114	81,191
Knight Central	26,000	120	6,567	27,895
Langlaagte Estate	55,002	200	14,273	60,628
Luipaardsvlei Estate	18,170	60	4,471	18,992
Main Reef West	21,330	100	7,362	31,272
May Consolidated	15,560	100	3,339	14,183
*Meyer and Charlton	14,880	75	7,927	33,672
Modderfontein B.	36,100	80	15,756	66,927
New Goch .	28,100	120	6,420	27,270
New Heriot . .	12,800	70	5,218	22,165
New Kleinfontein .	45,000	200	16,524	70,189
New Modderfontein	52,250	180	23,247	98,747
New Primrose ..	26,500	160	8,578	36,437
New Rietfontein Estate	16,080	120	4,061	17,250
New Unified . .	12,650	60	3,778	16,048
Nourse Mines	52,400	260	19,096	81,115
Princess Estate	22,600	60	6,810	28,927
Robinson	62,600	250	25,251	107,259
*Robinson Deep	64,000	160	20,009	84,993
Randfontein Central . ..	219,166	865	68,768	292,108
Roodepoort United M. R.	32,823	60	6,342	26,939
Rose Deep	69,830	300	21,963	93,293
Simmer Deep	63,000	180	12,293	52,217
Simmer and Jack	79,700	320	17,370	73,783
Spes Bona Tribute	6,257	40	1,530	6,499
Van Ryn Gold Mines ...	40,100	140	13,138	55,607
Village Deep	50,800	180	18,219	77,389
Village Main Reef	39,800	220	15,426	65,525
Vogelstruis Estates	13,650	80	3,744	15,903
West Rand Central	2,206	20	796	3,381
West Rand Consolidated	32,500	100	11,153	47,372
Witwatersrand	38,870	220	12,033	51,113
Witwatersrand Deep	47,370	245	16,009	68,002
Wolhuter	30,000	120	8,932	37,941
Miscellaneous Producers ...	—	70	4,008	17,026
Outside Districts.				
Heidelberg—				
Nigel	13,200	75	4,709	20,003
Sub-Nigel	5,010	20	2,376	10,093
Barberton—				
Barrett	—	—	213	905
Sheba-Rosetta	989	20	404	1,716
Sheba	6,370	60	3,242	13,771
Worcester Exploration ..	6,500	40	1,356	5,760
Lydenburg—				
Ceylon Lydenburg .. .	616	5	264	1,121
Glynn's Lydenburg ..	3,145	20	1,566	6,652
Transvaal G.M. Estate ..	15,300	75	10,305	43,773
Klerksdorp—				
Quest	4,275	35	768	3,262
Miscellaneous producers ...	—	190	7,754	32,938

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* Jumpers-cum-Treasury, 131 ozs. taken from production and added to reserve. * Meyer and Charlton, 2,416 ozs. taken from reserve and included in declared output. * Jupiter does not include 100 ozs., value £425 taken from reserve and added to declared output. * Robinson Deep does not include 403 ozs., value £1,712, taken from production and added to reserve.

Sheba G.M. Co.

The results for the month of May, 1913, are as follows: Sheba Mine: Mill ran 28 days, crushing 6,370 tons, yielding 3,241 ozs. of fine gold; estimated profits, £4,791. Rosetta Mine: Mill ran 16 days, crushing 989 tons, yielding 315 ozs.

First Class Mining Positions

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics. — E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, Corner Eloff and Pritchard Streets. Box 2061.

THE MAY OUTPUT: GROUP RETURNS.

Corner House Profit, £516,000—Further Improvement in Barnato Returns.

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of May:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	69,830	16/ 7	21,963	£34,807
Geldenhuis Deep	300	7	60,000	23/ 4	20,907	18,255
Nourse Mines	260	7	52,400	22/ 1	19,096	22,671
Ferreira Deep	255	7	58,130	19/ 6	29,713	68,660
Crown Mines	660	26	196,000	16/10	67,432	119,478
Durban Rood. D	100	3	27,250	23/ 6	9,593	8,237
Totals & averages	1875	57	463,610	19/ 0	168,704	£272,108

The following are the results of crushing operations of Central Mining companies for the month of May:—

Company.	No. of Stamps	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	36,100	15/ 4	15,756	£38,861
New Modder	180	7	52,250	19/ 3	23,247	48,025
City Deep	150	9	42,300	25/ 5	19,468	28,188
Village Deep	180	7	50,800	18/10	18,219	28,974
Village Main	220	6	39,800	18/ 3	15,426	28,386
Robinson	250	6	62,600	13/ 1	25,251	65,778
Bantjes	100	3	30,700	21/ 4	9,343	6,433
Totals & averages	1160	43	314,550	18/ 5	126,710	£244,645

Crown Mines, Limited.—Decrease in rate of yield of 9½d. per ton caused by reduction in number of natives employed in the rich section of eastern part of mine and the best section of western workings.

Barnato Group.

The following are the result of operations on the crushing mines of the Barnato group for the month of May:—

COMPANY	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte	100	49,850	£66,030	£23,296
Ginsberg	80	15,465	21,018	6,088
Glencairn	160	22,050	16,431	2,452
New Primrose	160	26,500	36,436	19,046
New Rietfontein	120	16,080	17,250	1,821
New Unified	60	12,650	16,049	5,134
Quest	35	4,275	3,264	97
Witwatersrand	220	38,870	51,116	24,015
May totals	935	185,740	£227,594	£81,949
April totals	935	175,194	£226,491	£82,350

Monthly gross profits for year 1913:—January, £79,198; February, £74,114; March, £81,152; April, £82,350; May, £81,949.

Goerz Group.

The following are the results of operations of the crushing mines comprising the Goerz group for the month of May:—

	No. of Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated	100	—	15,560	£14,150	£4,270
Princess Estate	60	5	22,800	28,849	2,261
Geduld	50	2	14,550	18,700	2,569
	210	7	52,910	£61,699	£9,100

The monthly profits for 1913 are:—January, £15,417; February, £10,317; March, £8,554; April, £8,860; May, £9,100.

The Albu Group.

The May operations of the producing mines of this group were as follows:—

Company.	Stamps.	Tube Mills.	Tons Crushed	Total Cost.
Aurora West	80	—	14,925	£14,795
Cinderella Consolidated	70	3	16,120	23,292
Meyer and Charlton	75	2	14,880	12,899
New Goch	120	4	28,100	22,661
Roodepoort United	60	4	32,823	24,711
Van Ryn	140	6	40,100	30,478
West Rand Consolidated	100	4	32,500	36,218
	645	23	179,448	£165,054

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	19/ 9·9	£19,538	£4,743
Cinderella Consolidated	28/10·8	19,227	*4,065
Meyer and Charlton	17/ 4·0	33,541	20,642
Do. (reserve gold declared)		10,262	10,262
New Goch	16/ 1·5	27,196	4,535
Roodepoort United	15/ 0·7	26,960	2,249
Van Ryn	15/ 2·4	55,959	25,481
West Rand Consolidated	22/ 3·5	47,277	11,059
		£239,960	£78,971
Less loss			4,065
Net profit			£74,906

* Loss.

The profits for the first five months of the year are:—January, £66,262; February, £58,056; March, £63,830; April, £64,776; May, £74,906.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for last month of the undermentioned companies of the Consolidated Gold Fields group:

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack	320	7	79,700	17,370	£32,502
Robinson Deep	180	10	64,000	19,606	32,501
Knights Deep	400	11	110,700	19,114	*22,759
Simmer Deep	180	9	63,000	12,293	5,892
Jupiter	120	6	42,450	10,544	5,163
Sub Nigel	20	1	5,010	2,376	2,466
Totals	1220	44	364,860	81,303	£101,283

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £2,500; Robinson Deep, £357; Knights Deep, £728; Simmer Deep, £403; Jupiter, £656; Sub Nigel, £384; total, £5,028.

*Knights Deep.—Of the total profit, £2,984 must be deducted in terms of circular to shareholders, dated 26th September, 1912.

Robinson Group.

The following are the results of operations at the Robinson group of mines for May:—

	Tons Milled.	Total Fine Ozs.	Estimated Profit.
Langlaagte Estate	55,022	14,273	15,000
Randfontein Central	234,166	68,768	84,180
	294,166	83,041	99,180

Langlaagte Estate: Estimated profit per ton milled, 5s. 5·45d.; Randfontein Central: Estimated profit per ton milled, 7s. 0·47d.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Wit. Deep	47,370	£67,310	£27,160
Wolhuter	30,000	37,436	10,324
Cons. Main Reef	24,542	35,807	11,087
Main Reef West	21,330	30,853	6,477
Knight Central	26,000	27,569	2,008
Total for group			£57,056

The monthly profits for 1913 are:—January, £53,085; February, £46,112; March, £51,917; April, £56,827; May, £57,056.

Base Metals.

Zaaiplaats Tin Mining Co

The results for the month of May, 1913, are as follows: Days run, 27·5 days; ore milled, 3,250 short tons; residues re-treated, 1,027 short tons; concentrates won, 112 long tons; average value of concentrates, 71·73 per cent. metallic tin; estimated profit for the month, excluding Government tax on profits, £10,438 6s. 3d.; deduct adjustments in respect of estimated values of previous shipments, £40 11s. 3d.; profit declared for the month, £10,397 15s.; capital expenditure, nil.

Rooiberg Minerals Development Co.

The following are the particulars in regard to the operations on the Rooiberg Minerals Company's property for May:—Stamps, 10; days run, 29·932; tons milled, 2,961 short; concentrates, 103 long tons; average assay value, metallic tin, 69·11 per cent.; estimated profit, £6,920 16s. 10d.; adjustments in respect of previous shipments due to fluctuations in the price of tin, to be subtracted, £118 11s.; profit for month, £6,802 5s. 10d.; net capital expenditure, £645 15s. 10d. The concentrates in reserve at the 31st May, 1913, amounted to 17·33 long tons (2,240 lbs.) of the net value of £1,616. £2,718 has been included in working costs for the month in respect of shaft sinking, exploration and development. Tonnage milled includes 1,195 tons sands re-treated.

It is the intention of His Excellency the Governor-General to proclaim at an early date as an alluvial digging, in accordance with Section 15 of the Precious Stones Ordinance, 1903, of the Transvaal, a portion of the farm Avondster No. 331, district Bloemhof, mining district of Klerksdorp, Transvaal Province, registered in the name of Frederick Johannes Hennig.

QUARTERLY REPORTS.

Geduld Proprietary Mines.

For the quarter ended the 31st March at the Geduld Proprietary Mines 39,520 tons were milled, and the revenue from gold amounted to £54,906, or 27s. 9·139d. per ton. Working expenses, including £8,892, or 4s. 6d. per ton for mine development redemption, absorbed £45,061, or 22s. 9·651d. per ton, which left a working profit for the quarter of £9,845, or 4s. 11·78d. per ton. Sundry sources of revenue brought in £2,085, making together a balance of profit for the quarter of £11,930. Revenue and expenditure account, which includes capital expenditure, shows that the expenditure charges exceeded the receipts by £25,320. The main incline shaft was sunk 250 feet, and on mine development 3,077 feet were driven, risen, sunk, etc. For the three months ended 31st of March, the footage sampled on the reef totalled 1,785 feet, assaying 7·72 dwts. over 32·3 inches, of which 1,155 feet assayed 9·21 dwts. over 35·5 inches, and 630 feet assayed 4·08 dwts. over 26·5 inches. The decreased profits for the quarter are due to changes in the mine and mill in preparation for the enlarged reduction plant, and it is anticipated that for the same reason profits for the next two months are likely to be similarly affected. It is expected that the enlarged plant will be in operation in June.

Geldenhuis Deep.

The directors' quarterly report of the Geldenhuis Deep, Ltd., for the three months ended 31st March states, *inter alia* The revenue was £243,341, equal to 29s. 6d. per ton milled; the total working expenditure, £204,221, equal to 24s. 9d. per ton milled, and the working profit, £39,120, equal to 4s. 9d. per ton milled. Number of feet driven, sunk and risen, exclusive of stopes, 6,209 feet. The reef disclosures were as follows:—Main Reef: Distance exposed, 1,049 feet; width, 22 inches; assay value, 53s. 9d. Main Reef Leader: Distance exposed, 1,463 feet; width, 11 inches; assay value, 81s. 6d. South Reef: Distance exposed, 3,037 feet; width, 16 inches; assay value, 81s. 6d. Ore received from mine, 202,030 tons; waste sorted out, 18·5 per cent.; tonnage crushed, 164,600 tons; number of stamps operating, 300; number of tube mills operating, 7; mill yield per ton, 20s. 3d.; assay value of pulp, 11s. 5d.; total, 31s. 8d.; total yield, 57,903 ozs. fine; total yield per ton, 29s. 7d.; accumulated slimes, tonnage treated, 3,960 tons; accumulated slimes, yield, 467 ozs. fine. The total development footage for the quarter was 6,209 feet, as compared with 6,110 feet for the previous three months. Waste packing and timbering under the railway were proceeded with throughout the period. The erection of a fan at No. 1 shaft, for the purpose of improving the ventilation of the underground workings in the east section, will be completed in a few weeks. The whole of the plant on the east and west sections is now being operated by power purchased from the Rand Mines Power Supply Co., Ltd. There was an addition to the labour force during the period, the total number of natives in the company's service at the end of the quarter being 5,749, as against 5,484 for the previous quarter. The capital expenditure was £2,695, and the amount to be spent for the completion of the work authorised stands at £14,580, which includes a sum of £8,710 for the installation of an underground winder, west section, which probably will not be required. The eighteenth ordinary general meeting of shareholders will be held in the board room, Corner House, Johannesburg, on Friday, 6th June, at 12 noon.

Luipaardsvlei Estate.

The Secretary writes:—We beg to advise you that the following is the result of operations for the month ended 31st May, 1913:—60 stamps ran 29·426 days, crushed 18,170 tons, yielded 2,008 ozs. fine gold. Three tube mills ran 30·45 days, yielded 804 ozs. fine gold. 12,950 tons sands treated, yielded 1,214 ozs. fine gold; 5,220 tons slimes treated, yielded 144 ozs. fine gold; working profit, £2,244; sundry revenue, £900; total profit, £3,144; working costs, 18s. 1·865d. per ton.

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Rhodesian Section.

LATEST MINING NEWS.

The Cam and Motor—The Shagari Mines—Eldorado Banket—The Wanderer—The Lonely—Tanganyika Concessions.

A Gatooma firm has secured the contract for erecting over eight hundred tons of steel buildings, at the Cam and Motor mine. At the present rate of progress there is every prospect of this mine entering the list of gold producers, about the end of the current year. Truck loads of iron and other materials for the new works continue to come forward *en route* to the Eiffel Flats.

* * * *

For some weeks past, says the Salisbury correspondent of the *Rhodesian Mining Review*, considerable activity has been manifest in the Shagari district, and the results of development, which have been going on during the last few months, go a long way to justify the optimistic feeling which prevails in the locality. What is, perhaps, of most importance is that new discoveries are turning out well—better, in fact, than even the most hopeful anticipated; and the general impression seems to be that the Shagari district is likely to become an important adjunct to the gold belts in and around Hartley and Gatooma. The most important results within the last few weeks are probably those which the Shagari Mines, Limited, have secured. Their Dalny West property, in particular, is turning out extremely well. A great deal of driving has been done, and the results in the way of values are almost phenomenal. The average assay values over 14 ft. of their 20 ft. reef, at a depth of 100 ft. are a trifle over an ounce. The Rhodesian Main Reef property, belonging to Mr. C. Tallon, also gives promise of great things. The claims, which were forfeited some time ago, have been re-pegged by Mr. Tallon, who has obtained from panning as much as 2 ozs. to the ton.

* * * *

At the Cam and Motor Mr. Gardiner, who returned from a visit to the property recently, reports that all's well; and, according to other information, it seems that the erection of machinery is being proceeded with at an unusually rapid pace. The same condition of things exists at the Shamva, where trains loaded with plant are continually arriving. The Kimberley Reefs management are also optimistic with regard to the working of their stamps; it is whispered that the first declaration is likely to exceed expectations. The old Ayrshire plant is being dismantled and transported to the Golden Kopje.

* * * *

The Lomah Stoessel Company has made some considerable changes in its local management. It is now represented in Salisbury by Mr. B. G. Derry, and it is needless to add that it could not be in better hands. Work on the Kambanje has been resumed, and, according to all accounts is giving much satisfaction.

* * * *

In the recently issued circular regarding the trial crushing on the parallel reef of the Eldorado Banket, the details were promised as soon as available. In this connection the following cablegram received by the London office in mail week from Mr. H. A. Piper will be of interest:—" Milling tests to May 2nd average 3 dwts.; will be completed in a few days."

* * * *

Susanna Mine.—Cable to the London office in mail week: 11th level spur reef advanced to 47 ft. from main winze. At 45 ft. reef 43 ins. wide assays 16 dwts. Fourth level, south shoot, drive south advanced to 14 ft. At 11 ft. 6 in. reef 29 in. wide assays 41·8 dwts. Lady Lina: No. 3 level south drive advanced to 60 ft. from shaft. At 55 ft. reef 55 in. wide assays 7 dwts.

In mail week, the consulting engineer of the Wanderer, Selukwe (Mr. Noel Griffin), telegraphed:—Camperdown grade of ore under 1 dwt. for the month of April, consider essential shut down the mine end of May. (Official note.—The cablegram from the consulting engineer refers to the closing down of the Camperdown section only, as was recently foreshadowed, and does not affect the other sections, the improvement in grade referred to being from the Wanderer.)

* * * *

The following is a cabled summary of the consulting engineer's report on the Lonely for the quarter ended March 31, 1913:—" Development work, 920 ft.; mill ran 73 days, crushed 11,536 tons, yielding 10,856 ozs. Ore reserves, 174,667 tons, average value 1 oz. 1 dwt. No. 8 level, south drive, advanced from 454 to 619 ft.; average width of reef is 27 inches, assaying 9 dwts.; last 30 ft. drive I oz. 4 dwts. 14 grs. over 34 inches. No. 9 level, south drive, advanced from 246 to 532 ft.; average width of reef is 41 inches, assaying 1 oz. 1 dwt.

* * * *

At the annual meeting of the Tanganyika Concessions Company, held in London the other day, Mr. Tyndale White stated that the company's debt had been reduced by £183,056.

Mr. Robert Williams said he was certain that the Benguella Railway at no remote period would bring Northern Rhodesia within a fortnight's journey of London, and make it the highway into South Africa, with a natural port at Lobito Bay. With their title secured, and with an increasing local traffic, they would be in such a strong position that they might easily bring off a deal for the immediate extension of the line to Kambove, in connection with which there were several methods of financing, independent of further financial assistance from the Tanganyika Concessions. The labour supply formed a serious problem. Northern Katanga, upon which they had been depending, had completely failed. The natives there were physically poor, and the supply was inadequate. He hoped for good results from the agreement with the Rhodesian and Portuguese authorities, and a fair supply was now being obtained. The smelting plant would be shortly increased to six furnaces, increasing the output of copper to 36,000 tons yearly. The company possessed railway and mineral share assets valued at six millions sterling, against a debenture debt of £2,241,823. He believed the Chartered Company would be only too pleased to take over the debenture guarantee of the Rhodesia-Katanga railway if the line were leased to them, but this would only be feasible on a profit-sharing basis with proper safeguards as regards rates, etc. Negotiations on these lines were actually proceeding.

Rezende Mines.

The results for the month of May, 1913, are as follows: Central section, estimated profit, £1,016; old west workings, estimated profit, £671; Penhalonga section, estimated profit, £851; total estimated profit, £2,538.

South African Mining Journal

REMOVAL OF OFFICES.

The Offices of the South African Mining Journal are now situated at Nos. 176 to 180, STOCK EXCHANGE BUILDINGS, Fox Street, Johannesburg—(2nd Floor).

THE WEEK IN THE SHAREMARKET.

An Improving Tendency Follows Weakness— Diamonds in Demand.

THE greater part of the week was given over to weakness and uncertainty, caused by fears of further Balkan troubles, tightness of money in London, and local strike rumours. By Friday, however, the outlook had begun to change, and there is now nothing to stand in the way of a good dividend market. Already one or two satisfactory Rand dividends have been declared, and the next few days should see the list lengthened. The feature of the week has been the weakness of Brakpans, caused by more rumours from the mine. As a fact nothing is known officially to warrant any uneasiness, and the fall in the price must be set down to a "bear" attack. Other favourites like State Mines and Springs have been marked down in sympathy with the general market, but should improve with the altered conditions. Van Ryn Deeps keep firm, and in good demand. All the gilt-edged dividend-paying stocks of the Central Mining-Rand Mines group kept firm in the face of the setback, except City Deeps. Main Reef Wests continue to be a weak feature. The whole position of the market in Rand stocks is now on a healthier basis, and the recent "shake out" makes for a return of strength and activity.

TINS.

The tin market naturally did not escape the weakness prevailing during the first few days of the week, but "tins" were the first to firm up. Zaaiplaats maintained their price very well, and are in strong hands. The liquidation in Rooibergs seems at last at an end, and the stock is much firmer. Swazis are being bought on dividend prospects, and Leeuwpoorts, in view of the annual meeting, are being enquired for. The tin section of the market promises to provide some excitement in the event of a good general market.

DIAMONDS.

Diamond shares continue to attract much attention and, with tins, promise to lead activity under better market conditions. Frank Smiths receded with the tide, but firmed up towards the end of the week and now wait upon a good report from the property. Crown Diamonds have come into strong demand and advanced in the face of the general weakness. Excellent reports have been made on the prospects of the mine, and there is reason to believe that under the new conditions the property is at last coming into its own. The unlisted diamond stocks have been flat, but an all-round increase in quotations in this section would not be surprising in view of the continued improvement in the market for the stones.

	Friday, 6th.		Sat., 7th.		Mon., 9th.		Tues., 10th.		Wed., 11th.		Thur., 12th.	
African Farms	16	0B	17	0B	17	0	16	6	16	6B	16	3B
Apex Mines ..	—		—		—		23	6P	22	9B	21	0s
Bantjes Cons. ..	22	0	—		21	9s	20	0B	20	3B	20	0B
Benoni Cons. ..	3	0B	3	0s	3	0B	3	3s	3	0B	3	0B
Blaauwbosch Dia.	—		120	0s	—		120	0s	115	0s	—	
Brakpan Mines ..	78	0B	78	0B	—		76	3B	76	3B	72	0B
Breyten Collieries..	—		—		—		30	0B	—		—	
British S.A. ..	—		20	0B	—		—		—		20	0B
Bushveld Tins ..	—		1	0s	0	6B	—		0	6B	0	6B
Cassel Coals ..	—		15	0B	—		—		—		15	0B
Cinderella Cons. ..	6	6B	6	6B	3	0B	—		6	6B	6	3B
City & Sub. (£4) ..	51	0s	—		50	0	49	0B	49	9	49	6B
City Deeps.. ...	60	6	*60	6	60	6B	59	6	59	0	58	6
Cloverfield Mines ..	5	9s	5	4B	5	3B	5	2B	4	10B	4	10B
Clydesdale Colls. ..	8	6B	8	6B	8	6B	—		8	6B	8	3B
Cons. Investment	21	0B	21	0B	—		20	0B	—		21	0
Cons. Langlaagtes	24	6B	25	0	25	3	24	6B	—		24	6
Cons. Main Reef ..	18	3B	18	3B	18	6	18	0B	18	0B	18	3B
Cons. Mine Select.	—		—		—		—		14	0s	—	
Coronation Colls. ..	—		15	0B	15	0B	—		—		—	
Coronation Freeholds	0	6	—		0	5B	—		0	6s	0	3
Crown Diamonds ..	9	3B	9	0B	9	3B	9	6B	9	6B	10	3
Crown Mines ..	—		140	0B	—		—		—		—	
East Rand Centrals	9	6B	9	6B	9	6	9	3B	9	0B	9	0
East Rand Coals (2 6)	1	10	1	9B	1	9B	1	9B	1	9B	1	10
East Rand Deeps..	2	6s	2	9s	2	6B	2	9s	2	5B	2	5
East Rand Props.	52	6B	53	0	53	0B	—		52	0B	52	6B
East Rand Debs.	£91B		£95s		£94s		£90B		£93	s	—	
Ferreira Deeps ..	—		—		—		—		—		57	0B

	Friday, 14th.		Sat., 7th.		Mon., 9th.		Tues., 10th.		Wed., 11th.		Thur., 12th.	
Frank Smith Dia. .	13	3	13	3B	13	3	12	9	12	6	12	3
Geduld Props. ..	23	0B	24	0	24	0B	23	9	23	3	22	6
Geldenhuis Deeps..			—		—		35	0s	—		34	0-
Glencoe (Natal) Colls.	7	0B	7	6B	7	0B	7	0B	7	3P	7	0B
Glynn's Lydenburgs	17	6B	18	6B	17	6B	18	3	17	6	17	9s
Government Areas	23	6	23	6B	23	6B	23	3	23	3B	23	0
Hex River Expls.	0	6B	0	6B	0	6B	0	6B	0	7P	0	6B
Jumpers	—		—		—		4	6	—		—	
Jupiters	9	3B	8	6B	10	0s	9	0B	7	9B	8	9s
Kaalfontein D. (2 6)	0	4B	0	4B	0	4B	0	4B	0	4B	0	4B
Klerksdorp Props.	2	3B	2	3B	2	3B	2	0B	—		—	
Knight Centrals ..	10	3B	10	0B	10	0	9	9	9	6	9	6
Knights Deeps ..	—		—		—		—		40	0B	—	
Lace Props. ..	3	9s	—		3	6B	3	3B	3	9s	4	0s
Luipaardsvlei Est.	9	3s	9	6B	9	0B	—		9	6s	—	
Lydenburg Gold Fms.	3	8	3	6B	3	6B	3	6	3	3B	3	4B
Main Reef Wests ..	9	6B	9	6	9	6	8	6B	8	6B	8	9
Main Reef W. Debs.	£75		£80s		—		—		—		—	
Middlevlei Estates	1	3	—		1	1B	1	2	—		1	1B
Modder B's ..	76	6B	77	0B	78	0B	76	6B	76	0	—	
Modder Deeps ..	35	0B	35	0B	35	3B	35	0	34	0	33	6
Natal Navigation Col	—		—		—		15	0B	—		—	
New Boksburgs ..	1	0B	2	0s	1	0B	2	0s	1	0B	1	1B
New Eland Diam...	30	0s	30	0s	29	6s	—		—		—	
New Era Cons (5 -)	7	7B	7	6B	7	6B	7	6	—		7	3B
New Geduld Deeps	2	7B	—		2	7B	2	7B	2	6B	2	7B
New Heriots ..	67	6B	—		—		—		—		—	
New Kleinfontein ..	21	9B	22	0B	21	6B	21	6P	21	0B	21	6
New Modders ..	—		—		250	0B	—		250	0B	250	0B
New Rietfonteins	5	0B	—		—		4	0B	4	3B	4	3B
New Unifieds ..	16	0B	16	0s	16	0s	16	0s	16	0s	—	
Nigels	20	0B	—		21	0s	20	0	—		—	
Nourse Mines ..	—		38	0B	—		—		—		—	
O.F.S. & Trans. Dia.	1	9B	1	10B	1	10B	1	10	1	9B	1	8B
Pickstone Golds ..	40	0B	40	0B	—		—		—		—	
Pretoria Cement Co.	—		—		55	0s	55	0s	—		55	0s
Rand Collieries ..	4	9B	—		—		—		—		6	0s
Rand Klips ..	1	8B	1	7	1	7B	1	7B	1	7	1	6B
Rand Nucleus ..	2	6	2	8s	2	6	2	6s	2	3B	2	4B
Randfontein Deeps	4	0B	5	0s	4	0B	4	0B	4	0B	4	0B
Randfontein Estates	26	6B	26	3B	26	0B	26	0	26	3*	25	6B
Roberts Victors ..	—		—		—		30	0B	31	0s	28	9B
Robinson Deeps ..	—		—		35	0	32	0B	34	0s	33	6B
Rooiberg Minerals	37	3B	37	6B	37	9	37	0B	37	3B	37	9B
Rood. Durban Deeps	—		—		—		—		21	0B	—	
Ryan Nigels ..	3	6B	3	6B	—		—		—		3	6B
Shebas	—		5	0B	5	0B	5	3B	5	0B	5	0B
S.A. Breweries ..	40	6B	—		—		—		40	6B	—	
S.A. Lands ..	3	7B	3	9B	3	10	3	6B	3	4B	3	6B
Springs Mines ..	18	3	18	0B	17	9B	17	3B	17	3B	17	3
Sub Nigels ..	13	6B	13	6	13	3B	13	0B	13	0B	12	9s
Swaziland Tins ..	—		—		49	0B	—		47	6B	48	0B
Trans. & Delagoa ..	40	0B	—		40	0B	—		—		40	0B
Trans. Coal Trusts	47	6B	47	0B	47	0s	46	9s	44	6B	44	0B
Trans. Cons. Lands	25	0B	—		—		—		—		25	0B
Trans. G.M. Estates	52	0	51	6B	51	6B	51	3B	51	0B	52	0
Tudors	1	9s	—		—		—		—		1	9s
Van Ryn Deeps ..	30	6	31	0	31	3	30	9	20	6B	31	3
Village Deeps ..	—		41	9B	—		40	0B	41	3	—	
West Rand Estates	3	6B	3	6B	3	6B	—		3	6B	—	
Witbank Collieries	45	0	45	0B	44	6B	44	6B	44	6B	44	6B
Witwatersrands ..	71	0	71	0B	71	0B	70	0B	71	0*	71	0B
Wit. Deeps ..	62	0	62	3	61	9B	61	0B	60	9	60	6B
Wolhuters	14	0B	14	6B	15	0B	15	0B	15	0B	15	0B
Worcester	23	6s	—		—		—		—		—	
Zaaiplaats Tins ..	49	6	52	0†	50	9	48	6	49	0	48	3

B Buyers. s Sellers. * Ex-London. ‡ 50 Shares. † 192 Shares.

South African Mining Journal

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The Offices of the SOUTH AFRICAN MINING JOURNAL are now situated at Nos. 176 to 180, STOCK EXCHANGE BUILDINGS, Fox Street, Johannesburg—(2nd Floor).

Engineering Notes and News.

A Large Mine Hoist Contract.

[Edwin N. Gunsaulus.]*

One of the largest and most important electric contracts recently awarded in connection with the Witwatersrand gold mining industry is that just received by the General Electric Co. of New York, through its subsidiary company, the South African General Electric Co. of Johannesburg, for supplying to the Crown Mines, Ltd., the largest electric mine hoist in the world, and, in fact, the largest hoist of any kind whatever which has ever been ordered. The hoist, which is to be supplied by the Schenectady shops of the General Electric Co., will raise 16,000 pounds of ore per trip in a vertical shaft 3,540 feet deep at a speed of 3,500 feet per minute. The weight of the empty ore bucket (or skip) is 8,700 pounds. The rope is 2 inches in diameter, weighing 6·4 pounds per foot. The hoist will consist of two cylindro-conical drums of which the smaller diameters are 12 feet and the larger (cylindrical diameters) 20 feet 8 inches. The speed of the drums will be 53·5 revolutions per minute. To either end of the drum shaft there are connected two direct-separately excited electric motors, designed for 500 volts, and each capable of giving continuously an output of 2,000 horse power at 53·5 revolutions per minute. The total weight of each motor will be approximately 142,000 pounds, exclusive of shaft and bearing. These two hoist motors will receive their power from a motor generator set which converts 50-cycle, three-phase power to direct current. The motor generator will consist of one 5,000 horse power (continuous rating), three-phase, 50-cycle, 2,000-volt induction motor, operating at 375 revolutions per minute, direct coupled to two 1,650-kilowatt, separately excited, direct-current generators. There will also be one 60-kilowatt, shunt-wound exciter for exciting the fields of the two hoist motors and the two direct-current generators. The system of control will be what is known as the "Ward Leonard" system. While the capacity of the motor generator set is equivalent to 5,000 horse power continuously, the intermittent output from the hoist motors may be at times 9,000 horse power, and the corresponding input to the motor generator set approximately over 11,000 horse power. The total weight of the motor generator set will be approximately 138,000 pounds, while its over-all dimensions will be approximately as follows: Length, 30 feet; width, 11 feet 6 inches; height, 10 feet 3 inches. The dimensions of the hoist motor armatures are so great as to make their transportation over the South African Railways impossible, and it will therefore be necessary to assemble and wind them on the spot. It is understood that the contract price for this electric hoist is approximately $125,000.

No Railless Electric Trams. Representations were recently made by the Executive Committee of the Municipal Association of the Transvaal to the Government that the necessary equipment of railless electric tramways should be admitted into the Union under Clause 4, Section 123, of the Customs Tariff, under which equipment for ordinary electric tramways run on rails was admitted into the Union on payment of a duty of 3 per cent. The reply received from the Department of Customs and Excise was to the effect that it was not possible to comply with this request, as Section 123 of the Customs Tariff referred "only to such tram cars as run upon rails." It was added, however, that the matter would be brought up for consideration when the revision of the tariff takes place. Notwithstanding this reply, the Committee again brought the matter to the notice of the Government, and expressed the hope that, in the interests of the local authorities concerned, the Government would allow such equipment to be admitted into the Union on payment of the duty for articles referred to in item No. 123. This hope, however, was not realised, as the interpretation of the tariff, given by the Commissioner of Customs, was accepted by the Government. At the annual meeting of the Association, to be held at Potchefstroom, the following recommendation will be moved:—"That this Association strongly protests against the interpretation placed on this matter by the Commissioner of Customs, and that the Government be again urged to reconsider the matter, with a view to the goods referred to being admitted into the Union under item No. 123 of the Customs Tariff."

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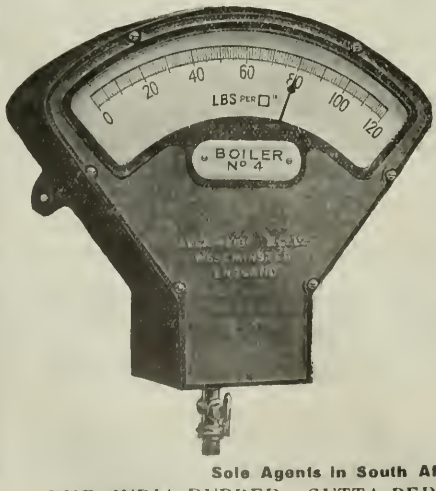
* U.S. Consul at Johannesburg, South Africa.



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PRESSURE and
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THE INDIA-RUBBER, GUTTA-PERCHA AND TELEGRAPH WORKS COMPANY, LTD.,
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Telegrams: "SILVERGRAY." Registered in England.

Finance, Commerce, and Industries.

Building Activity.

The report of the Labour Department for the month of April was published in this week's *Government Gazette*. This shows that eight municipalities in the Transvaal Province during the month of April approved plans having an estimated value of £171,159, as against £121,218 for the month of March, showing an increase of £49,941. Twelve municipalities in the Cape Province approved plans having an estimated value of £37,974, and the Durban Municipality passed plans having an estimated value of £31,435.

* * * *

Report of Trades Commissioner.

It is estimated, says Mr. C. du P. Chiappini, Trades Commissioner for South Africa in London, in his annual report, that during 1912 over three thousand persons called at the office in London for information concerning South Africa generally. The principal inquiries made related to export trades, farming matters, travelling facilities, opportunities which may be offered for the establishment of industrial concerns, etc. The department continues to be very largely utilised by visitors from South Africa who go to Europe on business matters. Due attention, says the Commissioner, has been paid to publicity work. There is a regular demand for the loan of sets of lantern slides depicting South African scenes and industries. In connection with this form of advertising valuable support has been received from the Railways Publicity Department. The question of exhibiting and advertising South Africa's produce has engaged close attention. The policy guiding the actions of the office has been to avoid any undue interference with established trades and not to attempt to divert the several trades from their legitimate avenues, but rather to aid and direct them into the natural channels of least resistance. By far the most important function of the department, remarks Mr. Chiappini, and that which has occupied most of his time, is the close study of the conditions and requirements of the markets connected with the sale of South African produce and also, where possible, the development of these markets. The question of the sale of produce is surrounded by problems which the farmer cannot be expected to follow. The Trades Commissioner then deals with the peculiar problems of each trade. In some instances it has been necessary for him to point out the serious effect which sudden increases in supplies have had on prices, as is the position with mohair and wattle bark, and in some cases he is able to suggest a new line of action or compelled to recommend a diminution in the production. On the other hand, in consequence of the erroneous ideas which have gained currency, he has taken pains to point out that there is no immediate fear of over-production in certain industries, as, for instance, ostrich feathers. A statement of general export from South Africa, covering the period from 1907 to 1912, shows an advance from £46,856,020 to £63,272,743. Produce of the mines represented a value of £37,801,403 in 1907 and of £49,394,640 in 1912. Produce of the land increased from £7,363,322 to £11,163,500.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME

His Majesty's :	Holloway Company	8.15
Standard		8.15
Empire		8.15
Carlton		7 to 11.15
Grand		7 to 11.15
Orpheum		7 to 11.15
Bijou		7 & 9

Latest Improvements in
Headgear Sheaves
Haulage Brake Pulleys
Up to 25 feet in Diameter.
Mild Steel Built up Sheaves
Specially Suited for deep Mining, any Section or Load.
Safety Detaching Hooks A Speciality
Full particulars from: THOMPSON & SOUTHWICK, LD.
(Export Dept.) ENGINEERS,
Cables: "PULLEYS." TAMWORTH, England.

PROGRESS OF NATAL INDUSTRIES.—III.

Exhaustive Review of Many Promising Activities—Coal, Tea and Whaling.

Tobacco.—The price of the Natal leaf has gone up considerably during the past few years, and should prove highly remunerative to the grower. Unfortunately, however, a great proportion of the leaf is grown by Indians, who do not pay much attention to its cultivation, and consequently are able to flood the market with an inferior leaf, which tends to keep the price down. As regards the present season's crop, although a greater area has been planted, the prolonged drought to which the country was subjected at a time whem young plants most needed moisture affected the growth, and it is feared that the present crop will hardly be up to the standard of recent years. The bulk of the better class of leaf grown in Natal is utilised for the manufacture of cheroots and cigars. Natal cheroots are getting widely known throughout the Union, and there is every reason to believe that the improvements now being made by the manufacturers will eventually bring Natal cigars and cheroots in such favour that they will take the place of the imported lines which come from India and the Continent. It is satisfactory to learn that the light qualities of Natal leaf are suitable for cigarette making. But little of those qualities is grown as yet. While no definite figures as to the Natal crop are obtainable, it is estimated that the crop of 1912 was between 500 and 600 tons—a little more than that of 1911. This year, 1910, when Mr. R. W. Thornton, the Cape expert, visited this Colony and gave lectures and issued a report on the subject, a number of farmers essayed the enterprise of ostrich farming. Owing to bad selection of foundation stock and ignorance of right methods of handling the birds very little success resulted in the initial stages. A few companies and individuals, however, who have started with first-class stock and expert management, are doing sound pioneer work, and there is little doubt that, when these have proved a financial success, as will be the case in two or three years, farmers who have the right conditions will again give this profitable industry a trial.

Fibre.—The fibre industry, which has encountered so many vicissitudes during the last ten or 15 years, seems at last to have entered a more promising stage. Aloes of the family Fourcroyea giganea have been growing practically wild in many parts on the coast line of Natal, whilst from time to time proper and regular cultivation has been taken in hand by various parties. The principal difficulty encountered for the economic exploitation of the plant seems to have been the want of suitable machinery for extracting the fibre from the plant on an economic scale. The difficulties, however, are being gradually overcome. There is one concern in Port Shepstone actually turning out rope of excellent quality made on the spot from fibre grown there. Another firm in the vicinity has just set up machinery, which it is claimed is extracting the fibre on an economic basis, monthly shipments of about ten tons of fibre are being shipped to Europe, and the article is realising remunerative prices.

Furniture.—The manufacture of furniture in Natal has assumed considerable proportions of late years. Whilst the importations of English and American furniture are still very large, there is every indication that in the near future the needs of the Province will be met more and more by the article manufactured on the spot. There are several well-equipped factories in Durban which are turning out a really good article, though they are not attempting as yet to compete with the more fancy furniture usually imported. Whilst some South African timber is used, most of the timber required comes from the United States, but it is hoped that when the forests of Zululand and other parts of South Africa are opened up suitable native timber may be found in such quantities as to ensure a constant and reliable supply.

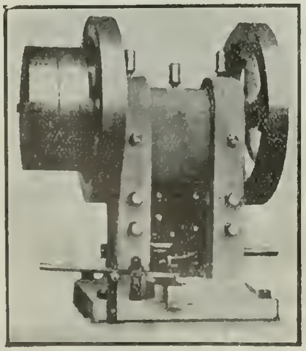
Potato Flour, Starch, and Sago.—Some six years ago a factory was built at Umgeni (Durban) for the manufacture of starch, flour, laundry starch, and sago from sweet potatoes. The factory encountered many difficulties at the outset, the reason being twofold—firstly, the difficulty of getting suitable machinery to treat sweet potatoes, as up to that time starch had been made from ordinary potatoes only; and, secondly, the supply of sweet potatoes could not be relied upon, and the costs of rail carriage were prohibitive. The factory was eventually closed down for financial reasons. Several of the principal shareholders, who happened to be farmers, saw, however, the latent possibilities of the industry, and built a new factory at New Wartburg, right in the midst of the sweet potato growing district, and equipped it with improved machinery. The new factory produced fairly large quantities of starch and flour and sago last year. Unfortunately, there is but a limited market for starch flour in South Africa, as its chief use is in the textile industries, and it is exported to Europe, where it enters into competition with the starch made from ordinary potatoes. The manufacture of laundry starch, which is the more intricate branch of the industry, is now being taken in hand, and the company confidently believe that at an early date they will be able to market a laundry starch in competition with the best imported.

Asbestos.—A new industry for Natal has come into existence of late years, *i.e.*, the manufacture of asbestos roofing tiles and asbestos slates for ceilings and partitions. The most satisfactory feature of this industry is that its products are purely South African. The raw material is mined in Zululand, where it is believed extensive beds of high quality asbestos exist. It is understood that as regards texture, strength, and toughness of fibre, Zululand asbestos is equal to the best found in Canada, and a shipment of raw asbestos made to London last year is said to have realised a most satisfactory price.

Glue.—A new industry, the first one of its kind in the Province, sprang into being during the year 1912, *i.e.*, the manufacture of glue. The company engaged therein is working up the heels from the Municipal abattoirs, also carcasses of animals, and there seems every reason to believe that in time this should become quite an important industry. Besides glue, the company is making neat's foot oil and fertilisers.

Rubber.—This most valuable commodity received a good deal of attention in Natal last year. In the south of Zululand and in Amatongaland indigenous vines of the family Landolphia Kirku, and in Natal proper, especially in the valleys of the Tugela and the Umkomaas, the Euphorbia tirucall flourish and yield a latex from which rubber is obtained. The Para rubber tree (Hevea braziliensis), has been planted in Zululand but has not thriven. The Ceara rubber tree Manihot Glaziovii) is, however, doing well there, and some 20,000 of these trees are now growing in Zululand. Small quantities of Landolphia rubber were exported during the year and realised 4s. per lb. To-day's market price is less. Of Tirucalli latex a fair quantity, probably between 100 and 200 tons, has been shipped and is believed to have realised from 9d. to 1s. per lb.

Accounts.—The statements of accounts show a balance in the bank and on deposit of £356 on Deceber 31st last, about the same amount as at December 31st, 1911. This, together with the value of the furniture (£70), makes the assets of the Chamber £126.



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:: Kimber Drill Sharpening Machines ::

STRIKE 1,000 BLOWS A MINUTE.

Chisel Jumpers up to 1¾in. guage sharpened at the rate of 4,000 a day.

50 Machines in use on the Rand.

The largest Mine on the Rand has put in four of these Machines the last year.

Machines made at our works and Guaranteed for twelve months.

MACHINES, FURNACES, SPARES, CUTTERS,
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MITCHELLS of Manchester make GRINDING MACHINES

AND GRINDING MACHINES ONLY. They have been doing nothing else for the past **FIFTY YEARS.** After fifty years' experience you can guess

They Understand the Business.

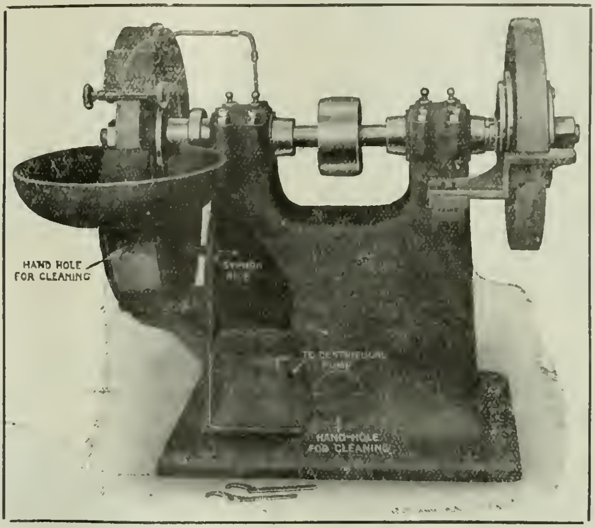
FEATURES.

Highest Grade.

Simple.

The Machine that Grinds the Most.

Built by Experts who specialise in this Business.



CONSTRUCTION.

The Dry Wheel is for genera grinding and shaping of tool before tempering, whilst the Wet Wheel is for sharpening tools.

The Illustration shews Pump and Fittings as arranged on our Tool Grinding Machines.

The Pump is of the Centrifugal Type and unaffected by gritty water. It has packed gland, and adjustment can be made to prevent leakage.

The Piping is metallic throughout, no rubber being used.

The Trough and Stand form Settling Tanks, and are each provided with mud hole and door, enabling the machine to be cleaned without taking to pieces.

The pump is arranged to take its water from a high level where cleanest.

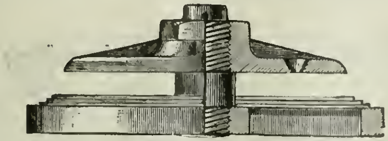
SOLE AGENTS :

D. DRURY & CO., Central House, Main Street, Johannesburg.

Box 3929. Machine Tool Showroom, Main Street (opposite Stock Exchange). Phone 560.

KINGHORN'S PATENT

METALLIC PUMP VALVES



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Air, Bilge, Circulating Fire, Feed, Sanitary, Hydraulic, and other descriptions of Pumping Machinery.

Full particulars from the Sole South African Agents :

GEO. CRADOCK & Co., Ltd.

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JOHANNESBURG.

P.O. Box 316. Phone 539.

The

S.A. Mining Journal

IS PUBLISHED WEEKLY

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Payable in Advance.

—AS A—

COMMERCIAL TRAVELLER

— THE —

S.A. Mining Journal

Is HARD TO BEAT.

Advertisement Rates on Application.

Automobile Notes.

In the House of Commons last week, Sir C. Henry asked the Prime Minister whether, in view that the Corrupt and Illegal Practices Prevention Act of 1883 laid down that no expenditure should be incurred in conveying electors to or from the poll, and that the use of motor cars at elections might be in contravention of the object of the Act, he would give facilities for the discussing of the Bill to regulate the loan or employment of motor cars for the purpose of conveying electors to and from the poll. Mr. McKenna said the Prime Minister could not grant facilities for the discussion of the Bill unless assured there was a general assent of the House to treat it as an agreed Bill.

* * * *

An indication of the extent to which the use of the motor car is spreading in South Africa is furnished by the fact that during last month, although the holiday season is long past, the number of motor cars passing through the Main Forest, Knysna, over the mountains, to the Longkloof, amounted to over sixty.

* * * *

The Society of Automobile Engineers, U.S.A., have been invited by the National Association of Automobile Manufacturers to make a thorough investigation of fuels suitable for use in motors, including kerosene and other low grade petroleum products, and to consider the possibilities of developing substitutes for gasoline. In the course of their experiments the S.A.E. will go into the question of carburetting devices.

* * * *

An "Automobile Laundry" has been started in Detroit, and has to do exclusively with the washing of cars. In eight weeks in February and March, 1,500 cars were cleansed, and it is anticipated that during the summer 100 will be dealt with daily. The process of cleaning has been divided into a series of operations, and the car entering at one door emerges at the other, in from twenty to thirty minutes, thoroughly cleaned as to mud and grease, the upholstery brushed clean of dust, the coach work polished with chamois skins and the brasses by electric buffers. The fee is 1 dollar 50 cents.

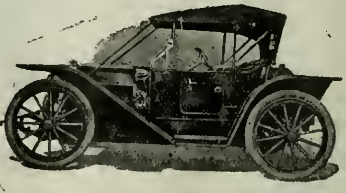
* * * *

It is stated that the Illinois Legislature will pass a Bill providing that if a policeman observes that the rear light of

South African Mining Journal

REMOVAL OF OFFICES.

The Offices of the SOUTH AFRICAN MINING JOURNAL are now situated at Nos. 176 to 180, STOCK EXCHANGE BUILDINGS, Fox Street, Johannesburg—(2nd Floor).



The K-R-I-T Car.

4 Cylinder, 25/30 h.p., BOSCH MAGNETO, ZENITH CARBURETTOR, 3 Speeds and reverse. Gate Change. Full Equipment, hood, screen, 5 Lamps, 5 detachable rims. 5 SEATER, £270. 2 SEATER TORPEDO, £265.

Sole Agents: REED BROS., Government Sq., Johannesburg.
Tel. Add.: "REEDWORK." P.O. Box 2720.
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WHY ALL THIS TALK ?

Results In Use Alone Prove Superiority

ALL THE PRINCIPAL RACES IN 1912 WERE WON ON

CONTINENTAL TYRES.

1st Grand Prix de France (957 Miles) on CONTINENTALS
1st Grand Prix de la Sarthe (405 Miles) on CONTINENTALS
1st Grand Prix de Belgique (720 Miles) on CONTINENTALS
1st Monaco Rallye (1,062 Miles) on CONTINENTAL
1st Targa Florio (640 Miles) on CONTINENTALS
1st Gaillon Hill Climb (101½ m.p.h.) on CONTINENTAL

JOHANNESBURG MOTOR SHOW - - STAND 10.

The Continental Tyre and Rubber Co. (S. A.)
WINCHESTER HOUSE, LOVEDAY STREET, JOHANNESBURG.
P.O. Box 1225. Telephone 223. Telegrams: "Contityres."
LONDON. —— HANOVER.

a motor car is not burning at night, he shall ascertain whether or not the lamp is hot, with a view to determining whether the lamp had been alight and accidentally extinguished.

* * * *

The London County Council has requested the Select Committee on Motor Traffic to receive evidence from Sir Edward White on the proposal to establish a Traffic Board for London as recommended by the Traffic Commission.

* * * *

Mr. S. F. Edge, well known to motorists in this country, has been unanimously elected to fill the vacancy on the committee of the R.A.C. caused by the resignation of Mr. F. Hedges Butler.

* * * *

The Roman Catholic Bishop of Treves has forbidden priests in his diocese from owning or riding in motor cars on the ground that such practices do not correspond with the principles of modesty which ought to distinguish the priestly calling.

* * * *

The greatest interest is being aroused in every quarter of the motoring world in the forthcoming exhibition of commercial vehicles at Olympia in July next, and the result promises to be one of the most important commercial events of the day. The purpose of the exhibition is to bring together the many types of vehicles now constructed under the heading of commercial motors. It will be one of the most significant exhibitions ever held at Olympia, and will comprise motor lorries, vans, charabancs, omnibuses, taxicabs, agricultural motors and tractors, motor fire engines, dust and water carts, ambulances—in fact, every conceivable variety of motor vehicle for light and heavy haulage, and for every commercial, municipal and agricultural purpose. Every leading manufacturer of commercial vehicles, petrol, steam and electric, will be represented, and accessories suitable for commercial vehicles will also be shown in great variety. A great gathering of interested visitors from all parts of the world is expected to attend this exhibition.

INVESTORS' DIARY.

The following company meetings have been announced:—

June 17.—Transvaal Consolidated Lands.
June 18.—Rand Mines.
June 27.—A. Goerz and Co.
July 1.—General Mining and Finance Corporation.
July 31.—Glynn's Lydenburg (Special).
Aug. 5.—City Deep.
Aug. 26.—Glynn's Lydenburg (Special).

MOTOR COVER AND TUBE REPAIRS AND RETREADING.

For Expert treatment by the oldest firm of Tyre Specialists in South Africa send your work to

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P.O. Box 8912. Telephone 2804. Tel. Add.: "RETREAD."

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£1000

Will be paid to anyone showing us a nut that CAN get loose through vibration where the **"FASTNUT"** Washer is properly applied.

No. 1. 3/- ea. Takes every Nut from 3/16 to 1/2 in.
No. 2. 7/6 ea. ,, from 3/8 to 7/8 in. without adjusting and ratchets.

Takes 8 Nuts. without adjusting and ratchets.

	1	2	3	4	5	6	7	8	9
Price	2/-	2/6	2/9	3/-	3/6	4/6	5/6	6/6	7/6

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Perpetual Calendars, Samples and prices on application.
Phone 12214 Central
Tel. Add: 'FASNUT' Central, London.

Supplies can now be obtained at the Stores of the Sole Agents:

BLACKHURST & CO.,
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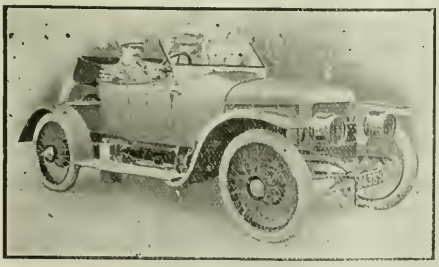
Box 375. JOHANNESBURG. 'Phone 251



15·9 H.P. Colonial Vulcan.
"Imperial," Three-seater with Two-seat Dickey.

Important Notice.

ONE CAR, as per illustration, for immediate delivery.
Price £450 complete.
ONE 5-SEATER, arriving incoming mail.
Price £475 complete.

These cars are beautifully finished, and deserve the closest inspection.

Demonstrations and all particulars from the Sole Agents:—

T. B. ADAIR & CO.,
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New Patents.

139. Christian Lodewicus de Jager.—Mine wick.
140. Otto Gustav Henrick Moll.—Improvements in the bell-pulls of electrical signalling apparatus.
141. Peter Miller.—Improvements in rock drills.
142. Charles Christopher Hansen.—Improvements in chucks.
143. Felix Loewenstein.—Improvements in electric glow lamps.
144. Allgemeine Elektricitatas Gesellschaft and Friedrick Eller.—Improvements in apparatus for printing tickets or the like automatically by selectors.
145. John Thwaites and Ernest Henry Cudaille.—Improvements in charcoal burning furnaces.
146. William McFerren.—Finger stopper.
147. Henry Wiseman.—A new and improved sewerage system, and means for the treatment of sewage and the like.
148. Charles Baxter.—Device for the prevention of stealing milk bottles and the contents thereof.
149. Emanuel Rosenberg.—Method of starting synchronous machines.
150. John Sellers Bancroft and Mauritz Christian Indahl.—Improvements in or relating to adjusting or centering mechanism for type machines.
151. William Lippiatt.—Improvements in catches or fastening devices for sliding doors, partitions and the like.
152. Michael de Prez.—O, the king horn gate.
153. Slaughter Co., Ltd., and Arthur Percy Strehmenger.—Improvements in the electric deposition of metals by fusion.
154. George Edward Heyl and Thomas Thorne Baker.—Improvements relating to internal combustion engines.
155. George Edward White.—Improvements in well pumps.
156. Tom Pollard.—An improvement for grinding pan for the treatment of diamond-bearing material.
157. Arthur White Allen.—Improvements in filtering turbid liquid.
158. Wilhelm Mauss.—Improvements in fluid actuated percussive coal cutters and the like.
159. Edwin Holland and John Flannigan.—Improvements in rope jockeys.
160. Wilhelm Goert Boomzaier.—Improvements in or relating to pumps and pump valves.
161. James William Graham Mortleman.—A holder for steel or metal bits of every shape as used in rock drills and similar machinery for boring ground of all descriptions.
162. Westbreek Arthur Harris.—A coupling for pipes when the thread of the pipe is broken.
163. Frederick Victor William Swanton and Thomas MacNair.—Improvements in hinges for self-closing doors and gates.
164. George Arthur Hardcastle Bridson.—An improved cattle dipping tank.
165. James Grant Gibson.—Ant-proof, fire and dry rot resisting preservative.
166. Ernice Capra, Bernandine Ulberti and Suiseppe Uberti.—Improvements in apparatus for killing flies.
167. Reginald Henry Kendall.—Improvements in or relating to the treatment of metalliferous sands or slimes.
168. James Elmes Arches.—Application for reverting cloth, leather and similar material.
169. Frederick Cristoffel Eloff.—An improved sand boring machine.

J. T. VIGNE'S SALES.

THE ABEL'S KOP GOLD MINING COMPANY, LIMITED (IN LIQUIDATION).

AUCTION SALE OF

Abel's Kop Complete Gold Mining Plant

PRACTICALLY NEW AND IN GOOD AND THOROUGH WORKING ORDER.

J. T. VIGNE, Auctioneer and Sworn Appraiser, being duly instructed by J. D. TYSON, Esq., in his capacity as the Liquidator of the Abel's Kop Gold Mining Company, Limited, will Sell by Public Auction, on the spot, **at ABEL'S KOP MINE** (District Schweizer-Reneke), Transvaal, situated about 15 miles from Schweizer-Reneke, 25 miles from Pudimoe Siding, 30 miles from Bloemhof, and 36 miles from Christiana.

On MONDAY, 14th JULY, Commencing at 11 a.m.,

THE FOLLOWING COMPLETE GOLD MINING PLANT (in working order), comprising:—

(a) TWIN SUCTION GAS ENGINE, 170 h.p., by Davey Paxman, with spares, together with 2 h.p. OIL ENGINE for starting process. Tanks and all other appliances complete. (b) ELECTRIC DYNAMO, 14 h.p., with Switch Board, etc. (c) THREE (3) EXTRACTOR BOXES (Zinc), measurements 12ft. 6in. long by 3ft. 6in. deep and wide (five compartments). (d) FILTER PRESS complete. (e) CLEAN-UP TUB, measuring 4ft. 6in. in diameter and in depth. (f) PIPING, VALVES, and FITTINGS complete. (g) PULLEY WHEELS and SHAFTING. (h) BELTING and PUMPS. (i) FIFTEEN (15) STAMP BATTERY and Battery Spares (1,250 lbs.) Five of these Stamps are absolutely new, having only recently been erected, but never used. (j) FITTER'S 20ft. LATHE and FITTINGS, MACHINE DRILL and FITTINGS. (k) STONE CRUSHER. (l) TWO (2) 14ft. TUBE MILLS. (m) SEVEN (7) 30,000 STEEL CYANIDE TANKS. (n) TWO (2) 30,000 GALLON WATER TANKS. (o) TWO (2) 20,000 gal. Sand TANKS. (p) ONE (1) BROWN VAT (20,000 gallons), complete with valves, piping, and taps. (q) CENTRIFUGAL PUMPS, consisting of sand pumps, sludge pumps, etc., complete. (r) BUILDINGS—Machinery Sheds, built of wood and iron. (s) STORES—Large quantity of usual Mine Stores, including Dynamite, Fuse, Detonators, about 60 Bags Lime, Piping, Tools, Windlasses, Chemicals, Portable Forge, etc., etc.

NOTE.—Place: at Abel's Kop Mine. Date: 14th July, 1913. Time: 11 a.m.

☞ CONSTANCE MINE MACHINERY. ☜

COMPLETELY NEW—NEVER IN USE,

Will also be Sold by the Undersigned at the Constance Syndicate Property, near Kraaipan Siding (Bechuanaland),

On Monday, 21st July, 1913, commencing at 11 a.m.,

To Wit: Five (5) **STAMP BATTERY, 1,250 lbs., by Fraser & Chalmers, Twenty-five** (25) **h.p. MARSHALL** (over head type) **ENGINE and BOILER complete. A LARGE QUANTITY OF ODDS AND ENDS.**

For Private Sale:—Complete Pumping Plant, consisting of 17 h.p. Allan Oil Engine, 6,000ft. of 2in. Piping, 6in. Evans Pump & 1,000 gal. Tank.

CATALOGUES containing full particulars of above Machinery, etc., can be obtained on application to the Auctioneer.

P.O. Box 559, Kimberley.

J. T. VIGNE, Auctioneer and Appraiser.

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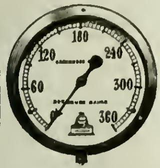

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177. Henry Eglbert Moore, Robert Boyle, and Refractory Ores, Ltd.—Solvent process for recovery of metals.
178. Petrus Arnoldus de Wet and Hermann [illegible].—A medicinal preparation.
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NOTICE IS HEREBY GIVEN that, in accordance with the conditions endorsed on the said Debentures, Debentures bearing the following numbers, viz. :

30	613	1139	1785	2131*	2643*	3167	3542
39	616	1155	1790	2158	2652	3169	3571*
82	631	1163	1808	2186	2670	3177	3583*
92	632	1173	1838	2187	2701	3180	3616
104	634	1222	1857	2217	2733	3181	3627*
107	668	1234	1860	2218	2739	3186	3636
200	679	1269	1867	2222	2746	3190	3646
215	721	1291	1890	2237	2747	3199	3660
220	723	1293	1893	2265	2753	3221	3661
236	724	1309	1914	2292	2763	3222	3712
259	734	1325	1917	2315	2764	3227	3750
264	739	1333	1921	2322	2818	3241*	3768
279*	792	1423	1927	2338	2822	3242*	3798
333	810	1424	1931	2370	2825	3248*	3827
339	835	1458	1944	2381	2841	3261	3832
340	858	1474	1955	2398	2898	3268	3845
352	865	1481	1957	2399	2902	3299	3848
375	866	1503	1963	2410	2903	3313	3853
409	867	1512	1966	2418	2908	3324	3855
414	888	1514	1972	2432	2909	3329	3856
457*	891*	1535	1976	2434	2933	3336	3875
461*	896*	1549	1986	2443	2947	3345*	3878
480*	897*	1561	1998	2444	2969	3371	3887
199	898*	1594	1999	2470	2978	3415	3913
515*	904	1608	2012	2489	2987	3421	3939
518	905	1611	2020	2517	3009	3424	3953
521	932	1630	2030	2524	3026	3449	3973
531	981	1631	2050	2533	3029	3453	3987
555	1025	1666*	2056	2536	3045	3159	—
581	1037	1696*	2066	2550	3058	3474	—
585	1072	1704	2076	2551	3066	3477	—
588	1123	1709	2090	2554	3067	3480*	—
589	1126	1715	2092	2580	3083	3498*	—
612	1128	1728	2103	2619	3135	3530*	—

were this day, at the London Office of the said Company, drawn by lot for redemption in the presence of James Thomas Bedborough, London Secretary of the said Company, and Robert Homfray James Comerford, Notary Public, and are payable on and after 1st July next, as to such of them as are payable in London, at the office of the African Banking Corporation, Limited, No. 63, London Wall, London, E.C., and as to such of them as are payable in Johannesburg, at the offices of the Company, Consolidated Gold Fields Buildings, Simmonds Street, Johannesburg.

The Debentures must be left three clear days for examination at the office at which they are payable, and previously to so depositing the Registered Debentures, the following form of discharge must be endorsed thereon, and dated and signed by the registered holder :

" Received the within-mentioned principal sum of one hundred pounds, and all interest to date."

London, the 20th day of May, 1913.

Countersigned. J. T. BEDBOROUGH,
ROBERT H. J. COMERFORD, Secretary.
Notary Public.

Debenture Bonds marked thus (*) are on the South African Register.

THE CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA, LTD., Secretaries.
Per C. HELY-HUTCHINSON.

Head Office : The Consolidated Gold Fields of South Africa, Ltd.,
Simmonds Street, Johannesburg.

13th June, 1913.

RAND MINES, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Eighteenth Ordinary General Meeting of Shareholders for the year ended 31st December, 1912, will be held in the Board Room, The Corner House, Johannesburg, on WEDNESDAY, 18th JUNE, 1913, at 11 a.m., for the following business :—

1. To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1912, and the Reports of the Directors and Auditors.
2. To elect Directors in the place of those retiring in accordance with the provisions of the Company's Articles of Association.
3. To determine the remuneration of the Auditors for the past audit and to appoint Auditors for the ensuing year.
4. To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under consideration by the Report of the Directors.

The Share Transfer Books of the Company will be closed from the 18th to the 24th June, 1913, both days inclusive.

Holders of Share Warrants to Bearer who desire to be present or represented at the Meeting must deposit their Share Warrants (or may at their option produce same), at the places and within the times following :—

(a) At the Head Office of the Company in Johannesburg, at least 24 hours before the time appointed for the holding of the Meeting.

(b) At the London Office of the Company, No. 1, London Wall Buildings, London, E.C., at least 30 days before the date appointed for the holding of the Meeting.

(c) At the Compagnie Française de Banque et de Mines, 20, Rue Taitbont, Paris, at least 30 days before the date appointed for the holding of the Meeting,

and must otherwise comply with the " Conditions as to the issue of Share Warrants or Bearer Shares " now in force.

Upon such deposit or production a Certificate, with Proxy Form, will be issued, under which such Bearer Warrant holders may attend the Meeting either in person or by proxy.

By Order of the Board,
H. A. READ, Joint Secretary.

Head Office : The Corner House,
Johannesburg, Transvaal, 19th April, 1913.

Durban - Roodepoort Gold Mining COMPANY, LIMITED.

(Registered in England.)

NOTICE IS HEREBY GIVEN that a Seventy-eighth (78) Interim Dividend of Ten per cent. (10 per cent.), equal to 2s. (Two shillings) per share, has been declared payable on and after the 28th of June, 1913.

Holders of Shares to Bearer should present Coupon No. 78 for payment of the above 2s. (Two shillings) per share at the Standard Bank of South Africa, Ltd., Johannesburg Branch, on or after the 28th June, 1913.

W. A. MARTIN,
W. MACFARLANE,
L. CLARENCE, Local Directors.

Johannesburg, 6th of June, 1913.

Trimble's Detective Agency, Limited.

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THE SOUTH AFRICAN
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WITH WHICH IS INCORPORATED
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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

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IMPORTANT NOTICE.

NOTICE IS HEREBY GIVEN THAT THE LONDON OFFICE OF THIS JOURNAL, IN SALISBURY HOUSE, HAS BEEN CLOSED. THE ENGLISH AGENCY OF THE PAPER HAS BEEN ENTRUSTED TO THE ARGUS PRINTING AND PUBLISHING COMPANY, LIMITED, BYRON HOUSE, 82-85, FLEET STREET, LONDON, E.C. OVERSEA ADVERTISERS AND SUBSCRIBERS ARE KINDLY REQUESTED TO PAY THEIR ACCOUNTS AND SUBSCRIPTIONS TO THE ARGUS COMPANY, WHO WILL GRANT RECEIPTS ON OUR BEHALF. PAYMENTS MADE TO ANY OTHER PERSON OR PERSONS WILL NOT BE RECOGNISED.

THE LOCAL OFFICES OF THE JOURNAL ARE NOW SITUATED AT 176-180, STOCK EXCHANGE BUILDINGS, FOX STREET (2nd FLOOR).

Notes and News.

The Strike. As we go to press the strike has taken a new and more serious turn by the decision of the Van Ryn Estates employees to "come out" in sympathy with those of the New Kleinfontein. The questions in dispute at the latter mine had earlier in the week been narrowed down to the inability of the company to take back all the strikers, owing to pledges to those who volunteered to work during the strike. The company, of course, could not think of sacrificing those who had come to its aid in time of trouble, and the inability of the strikers to consider the whole matter in cool blood is shown by their failure to appreciate the position of the company in this regard. If it is not too late, a final appeal might be made to the men at both mines to think before they embark on a struggle in which they are handicapped from the outset by being in the wrong, and which is as certain as night follows day to result in their own undoing. The duty of tht two mining companies concerned is clear. Morally and legally they are now wholly in the right, and they must resist to the uttermost the attempt to transfer the control of their mines to a handful of Trades Hall demagogues.

* * * *

The Bailey-Jeppe Group. Abstracts from the reports of the annual meetings of the Bailey-Jeppe Group will be found elsewhere in this issue. Shareholders will note that though there has been no sensational development in the case of any company there is steady progress shown by all. Mr. Julius Jeppe, who presided at the various meetings, reviewed the year at great length and in considerable detail. His forecasts were all of an encouraging nature, and with ample finances and large land and mining—especially tin mining—interests, a roseate future for these companies is assured.

S.A. Mining Directory.

The June issue of the *S.A. Mining Directory* has reached us. The work marks a considerable advance on its predecessors, and is replete with information, not obtainable from other sources, and invaluable to all connected, however remotely, with the mines. The work covers the whole field of South African mining and can be recommended as thorough, accurate, and comprehensive.

* * * *

The "Rhodes" of the North.

Mr. Robert Williams, who spoke at the Tanganyika and Zambesia meetings during mail week in London, will be described in the future history of the northern portion of South Africa as the man who found 6½ millions sterling for developing this territory. How he has succeeded in doing it is probably as much a wonder to himself as it is to other people. He was inspired by his great friend, Rhodes, who told him to "go north and see what was there." He went north, and returned to describe the northern portion of South Africa, not exactly as a land flowing with milk and honey, but teeming with mineral wealth and big possibilities. Now he is beginning to see the tangible results of a couple of decades of incessant work and anxiety, and of a period of stress and strain, during which he has at times been called upon to put the last penny he possessed into the business, to keep it afloat. The position to-day is that Tanganyika and Zambesia seem to have turned the corner; all the big assets are earning profits, and dividends are possible.

* * * *

The Rooderand to Liquidate.

The Rooderand Co. has made a big effort to find payable reefs in a part of the Transvaal which has attracted a very great deal of attention at various times during the past 15 years. It has failed to find those reefs, and it has consequently decided to wind up. The Rooderand Co. was floated on the assumption that the property contained the southern edge, or lip, of the Rand basin, and it has taken a good many years, and the expenditure of a good many thousands of pounds, to prove that the reefs are there, but that they do not carry enough gold to make them economically workable. The policy of the directors, as appears from the report, is to offer the shareholders the opportunity of putting the company into liquidation. A rough examination of the figures in the balance sheet would seem to suggest that in a liquidation there would be a return to shareholders of a little more than 1s. per share. It is difficult to arrive at an exact approximation, because the farms, the freehold of which the company owns, have to be sold, and one cannot tell what they will fetch. Possibly the price will vary to the advantage of the liquidation if the Government accedes to the application for de-proclamation, which apparently has already been done.

* * * *

The Search for a Stope Drill.

For all the years that mechanical ingenuity has been seeking to devise an ideal stope drill, the invention of that machine is still a thing to be desired, instead of a thing that has been achieved. At the Rand Mines, Ltd., annual meeting, held on Wednesday, Mr. R. W. Schumacher defined the ideal small machine as being "easily carried about and worked by one native, simple in mechanism, cheap in cost of upkeep, and capable of replacing the native on hand stoping under normal conditions." It is not our purpose to review the history of strenuous endeavour on the Witwatersrand to devise a machine drill that will comply with all these conditions. Suffice it to say that for years past efforts have been made, both by the larger rock drill manufacturing companies and by individual inventors, to manufacture such an appliance. Various types of machines have been placed on the market, and different makers have embodied different ideas as to valve arrangement, weight and general construction. It is not to be disputed that the work of the past few years has resulted in distinct advance and improvement, but apparently the "one man drill" of ideal efficiency and economy has still to make its appearance. The statement of the chairman of such an important concern as Rand Mines, Ltd., should not, however, prove a discouragement to inventors. On the contrary, it should stimulate them to further efforts. Mr. Schumacher stated: "It seems not unlikely, in view of the immense value of such a machine that something suitable will be evolved in course of time—possibly before very long." We interpret this remark to mean that enterprise in the direction of devising such a machine is far from dormant and having regard to the enormity of the market existing for an appliance of this kind we should be much surprised if it were.

* * * *

The Passing of Two Rand Companies.

The Boards of the Jubilee and Salisbury companies have issued notices calling a meeting to liquidate. This, of course, cannot be unexpected by the shareholders, since the companies ceased mining operations more than a year ago, but it is an event in the history of the Rand which should not be passed over without some comment. Both the Jubilee and the Salisbury companies were amongst the earliest to be floated on the Witwatersrand field, the Jubilee, as its name implies, having been floated in 1887, when the late Queen Victoria celebrated the jubilee of her reign. They were both Natal companies and we are sorry to hear that the original promoter of the Jubilee Co. is now lying seriously ill in a London hospital, and his recovery is extremely doubtful. The success of the two companies has been most marked, and while it would be possible to give a whole page of statistics as to the results which have accrued from working these two mines, we propose to limit ourselves to the statement that the Jubilee mine has produced more gold per ton than any other mine on the Rand, that it has paid its capital back in cash dividends more than 12 times, and has distributed in share dividends—Village Main Reef and South City shares—probably an additional 10 times the amount of its capital. The Salisbury Co., while it has been successful, was never such a rich mine as its neighbour, the Jubilee, but there again, it has paid over 400 per cent. in dividends. When these mines were on the verge of exhaustion the directors applied themselves to finding another property, and the shareholders, as we remember at the time, were very anxious that they should do so. It is most unfortunate that their choice fell on a group of mines in Rhodesia—the Claremont properties—which, apparently, although very rich on the surface, have reefs which either do not go down at all, or where they go down contain little or no gold below the 400ft. level. It will be a bitter disappointment for the shareholders that this venture, which promised so well, has turned out so unsatisfactorily that there is nothing for it but to liquidate the two companies, and we shall thus witness the disappearance from the share list of two of the best known and best managed companies which have ever operated on the Witwatersrand field. Judging from the available balance sheets of the two companies, there cannot be very much in the way of assets to be distributed.

* * * *

American Views on Tin.

Mr. James Farrell, president of the United States Steel Corporation, in the course of evidence recently given in the suit case brought by the United States Government against the company, made some remarkable statements with regard to the tin industry. He stated that the American Sheet and Tinplate Company were the largest single consumers in the world and imported all the pig tin they required, buying through their own agencies in Singapore and Penang. Asked as to what other sources of output were available to American manufacturers besides the Straits, he is reported to have replied as follows: "Australia, Tasmania, and the island of Banka and Billiton off the coast of Java; but the Java tin and what is known as the Banka tin are not available for use in making tinplate because of moisture which causes explosions in the pot. Bolivia also produces 15,000 tons of tin per annum, which is not suitable for tinplate because of the arsenic in the tin." Asked where the Welsh trade got its supplies from, he replied: "Principally from the Straits, although they have some tin in Wales, about 5,000 tons per year." Apparently the growing importance of this country as a tin producer escaped this authority.

* * * *

Rezende Mines.

The general meeting of Rezende was held in mail week. On the essential feature of ore reserves the general manager reports that in the Rezende section they amount to 145,599 tons, an increase of some 7,000 tons over the previous year, and in the Penhalonga section 75,496, making a grand total of 221,095 tons, of which 101,579 tons are estimated to have a value of 7·38 dwts. to the ton. The value of the ore in Old West workings has not yet been ascertained. The arrangement with the Penhalonga Co. having been completed, the two concerns are now worked as one with the consequent economy which was anticipated. The shareholders have had to wait till the fourth annual meeting for a dividend, but their patience has been abundantly rewarded, for they are receiving no less than 15 per cent. for the year 1912, and the prospects are reported to be promising.

* * * *

Consolidated Oil Fields.

We are in receipt of a report by Mr. J. E. Mills Davies on the Ceres properties of the Consolidated Oil Fields of South Africa, Ltd., which has been issued by that company. The document in question, which is illustrated by geological diagrams and photographs, is a carefully reasoned and logical statement of the possibilities of finding oil in this portion of the Cape Colony. It is couched in moderate and conservative terms, and there is nothing in it to justify the flamboyant extravagances of certain London contemporaries. The most important statement in the report is that dealing with gas indications. In this Mr. Davies says: "The most important indication of the existence of petroleum upon your properties is the gas, which has been observed at Bailie's Gat, and concerning which the evidence seems unquestionable. This gas has been found along the lower edge of a wide band of shale, which outcrops several hundred feet below the crest, over which the descent is made to the Gat, and at a distance of nearly a mile from the top of the crest. It occurs just where one would expect to find gas or oil seepages if the formation held petroleum, for the shale band may be regarded as a cover, which would prevent the escape of any gas or oil that might exist below. It is beneath this shale that a search should be made for petroleum."

* * * *

Some Aspects of the Native Question.

When Mr. R. W. Schumacher, some weeks ago, spoke of the importance of the report then about to be issued by the "Black Peril" Commission, he was evidently well informed, as the report issued last week is a document of great value. It is satisfactory to learn that mine boys are not responsible for the increase in "black peril" cases on the Rand in recent years. The supply of Kaffir beer to natives on the lines so successfully developed by the Durban Municipality is likely to be one result of the Commission's recommendations, and in several other directions the suggestions made are sound and practical. The compounding of natives on the "closed," or Kimberley, system, which is advocated by the Commission, has naturally led to a considerable controversy. Led by Mr. Schumacher, the mining people are almost unanimously in favour of the step, and the commercial community almost equally unanimous against it. It may be that in the course of the very lengthy and exhaustive discussion now proceeding a middle course, satisfactory to all, may be found.

TOPICS OF THE WEEK.

THE RAND MINES MEETING.

The proceedings at the annual meeting of Rand Mines, Limited, on Wednesday were varied by some interesting remarks from Mr. E. J. Renaud on the questions of cash reserves, selective mining, and taxation of investments. Mr. R. W. Schumacher's speech from the chair will be found elsewhere in this issue, supplemented by his sympathetic reply to the points raised by Mr. Renaud on behalf of French investors in Rand gold mines. Mr. Schumacher's speech was of the comprehensive and authoritative character we are accustomed to associate with pronouncements at Rand Mines meetings. He showed that the ore reserves of the group, totalling 32,301,587 tons, contain gold to the estimated value of £49,173,000, exclusive of the gold to the value of £4,393,000 in safety and boundary pillars which will also eventually be recovered. No one will deny his contention that apart from its finances and from current working profits, no surer view of a mining company's prospects can be obtained than by examining the state of its ore reserves, the value of developments in the lowest levels, and, of course, the size of the property. Mr. Schumacher explained that the general mining policy of Rand Mines, Ltd., has for years been to strengthen the ore reserves of the companies and to increase the number of stope faces in such a way that the mines can work at ease, and not under pressure or from hand-to-mouth, and this policy is now in many respects completed. He was able also to make the —to shareholders—satisfactory statement that in the case of most of the mines of the group the period of large construction programmes and of heavy capital expenditure was passed, and all energy could now be concentrated on working the mines to the best advantage. Mr. Schumacher also thinks that there can be no doubt that working costs will gradually be reduced. Efforts continue to be concentrated on mining to the best advantage in order to earn the maximum profit while working the mines fairly. On another vexed question Mr. Schumacher said: "We have, I know, been accused in some cases of resorting to selective mining. The phrase 'selective mining' has been used by various critics somewhat vaguely, and as if selective mining were necessarily wrong. I can only plead that if selective mining means working the payable ore of a mine and avoiding, as far as possible the unpayable ore, then we have indeed been guilty of mining selectively at mostly all our properties. We take pride in working our mines with the utmost care and of aiming primarily for profits." Mr. E. J. Renaud strongly supported the Chairman in these views, and certainly, as explained by both speakers, the question does not admit of much discussion. Mr. Schumacher declared that the mines of the group are continuing to pay special attention everywhere to proper ventilation and to improving the health conditions underground. "We are determined," he said, "to do everything not merely to check phthisis, but to stamp it out, if possible, and we are sparing no expense where health and life are concerned. The free use of water for spraying operations underground, the saturation of air after blasting and also throughout the day in the main air channels, control of blasting operations, single-shift system, and the removal of the majority of workers before blasting—these and other methods are either in practice now or, as in the case of the single-shift system, are being striven after. By the steps that are now being taken we expect to have ventilation at all our mines practically perfect in the course of the near future. With the help of all our men we hope to approach, as nearly as possible, ideal conditions of working underground." Mr. Schumacher also mentioned that special investigations have also for some time been taking place in connection with important branches of work on the surface. Everywhere efforts are being made to increase efficiency and prevent waste. Reduction costs on the surface, that is the cost of all surface operations between the shaft and the tailings dump, have recently been showing a steady decline on the group. For the whole of the year 1912 the average cost was 4s. 1·8d., while for the last four months of that year it had fallen to 3s. 10·4d. per ton. For the first five months of 1913 there is a further small reduction. Other items, such as the use of compressed air, rock drill machine maintenance, and workshop expenses, have received special attention, and very appreciable savings are being effected. As regards power, the mines of the group are now obtaining about 85 per cent. of their total power in the form of electricity and compressed air from the Rand Mines Power Supply Company, Ltd. An interesting point made by Mr. Schumacher was the smooth running of the new electric winders, for which all sorts of troubles had in some quarters been predicted. On other vital questions, such as native labour and native health conditions, Mr. Schumacher made important pronouncements. Mr. E. J. Renaud followed with some very interesting remarks, which we print elsewhere. His views on cash reserves and the so-called selective mining will be generally endorsed. The feature of his speech was his appeal to the Union Government to deal less harshly with the small oversea shareholder, and to adopt a more encouraging attitude generally towards the "outside" investor in South African enterprises. Mr. Renaud voices the views of an important number of French shareholders in the Rand, and his closely-reasoned and moderately-worded protest is bound to be seriously considered by the Union Government.

THE FIGHT AGAINST MINERS' PHTHISIS

Before the House of Assembly broke up this week, a motion was carried calling on the Government "to consider the advisability of appointing a commission to investigate and report on the health conditions of the Witwatersrand mines and the adequacy or otherwise of the measures hitherto adopted to improve such conditions." From this it will be seen that, despite the enquiries of the Tuberculosis Commission and of the Phthisis Prevention Committee, the House favours the calling of yet another such body into existence. As a fact, the Phthisis Prevention Committee has just completed its third report, and by the aid of the Minister of Mines publicity may be given to some of its more significant findings. The latest report deals with the investigations that has been made as to the amount of dust in the mines and the character of the dust. The first difficulty the Committee had to deal with was to find an instrument which could measure the amount of dust in the air. It has been discovered that it is only the very fine dust that gets into the lungs, and in this connection the Committee finds that respirators are practically no good whatever. These respirators do not catch the fine dust. The second problem is as to what is the relative efficacy of using pure water and water mixed with molasses for allaying the dust in mines. The Commission has come to the conclusion that pure water is more efficacious. They say that it is just possible that molasses may form a sort of sponge and catch the dust in parts where water is not actually being used. A paragraph in the report states that numerous experiments have been made to test whether a solution of molasses in water is superior to pure water, and the result is to show that water is, on the whole, superior for allaying dust in mine workings by spraying. Another series of experiments were made to find out the amount of dust at different times, before blasting, after blasting, during drilling, and so on. They show that the most serious dust is created by the blasting, and then by the drilling. Repeated microscopic examination of lungs of silicosis victims have been made, and comparisons have been instituted between the physical characteristics of extraneous mineral matter in these lungs and the dust arising from various mining operations. At the present time it may be provisionally stated that dust originated by blasting most closely resembles the dust incarcerated in silicosic lungs. Dump dust, dust from compounds and streets, are not characteristics present in silicosic lungs. The Report gives a comparison of dust in the streets of Johannesburg and Paris and other places, and points out that under the new conditions of the mines the comparison is not unfavourable to the mines, but there is this to be said, that the amount of dust in the streets of Johannesburg or Capetown, or Paris, may be comparatively large, but it is not that particular kind of dust which causes injury to the lungs. Another conclusion is concerning how far the bacillus of tuberculosis is communicated underground. It will be remembered that the Miners' Phthisis Commission expressed the opinion that the conditions underground are of such a nature that the bacillus can not live there very long, and that tuberculosis which superimposed upon the disease of silicosis was communicated above ground. This conclusion is to a certain extent not borne out by the further investigations. The report deals with this important point as follows: "For this purpose (that was of finding the amount of bacillus of tuberculosis underground) samples of expectorated material had been selected from the ladderways, stations, and ways underground, and from the compounds, single quarters, and beer-halls on the surface. Of 322 specimens examined, 120 have been obtained on the surface and 202 underground. Of the surface specimens, about 2·5 per cent. have been found to contain the bacillus, and of the underground specimens the same number have been found to be similarly infected. As far as they have gone these investigations appear to justify the assertion that the underground workings are infected to a certain extent, and that the ladder-ways are especially infected." The progress that has been made in laying the dust in the mines is shown in the returns on that matter from 1903 to 1912, quoted by the Minister of Mines. In 1903 the amount of dust in the mines in dry holes was 400 milligrammes; in 1904 it was 450 milligrammes; in 1912, 100; while in another mine it was 6, and in another again from 15 to 30. In dry holes with wet sprays it was 50 milligrammes in 1903, while it was now from 10 to 15. Similar improvements were noticeable in all parts of the mines. In dry stopes it was 35 in 1903, while it was now from 3 to 8. During blasting the figure for 1903 in one mine was 90, while immediately after blasting it was from 200 to 550. That had been reduced to between 30 and 90 milligrammes. It is noteworthy that in the course of the debate on the subject this week, Sir Lionel Phillips agreed that it was advisable from every possible point of view to improve the conditions in every possible way. He was glad that the Government had decided to stop recruiting in tropical areas, because it had been found that, in spite of all efforts, no great success had been achieved and the death-rate had kept on increasing. He asked the House to realise that a great deal had been done to improve the conditions. Of course, they must wait to see what would be the effect of the treatment advocated by Sir Almroth Wright. Furthermore, they should not forget that the Miners' Phthisis Act had only been in operation for one year, and he thought this Act should be given a chance. He said he was satisfied that everything possible was being done to counteract the dust and to make conditions as perfect as could be, and as a result he had no doubt that a considerable improvement would be brought about in the existing conditions. It might be, Sir Lionel Phillips said, some little time before the general effect of the improved system told its tale. With regard to a statement made by the Minister for Native Affairs the other day as to the medical care of natives, Sir Lionel called attention to the very strong protest that had been published from a number of doctors. As a matter of fact, most of these doctors were giving their whole time to this work. Sir Lionel went on to say that the matter of whole-time medical attendance on natives was one of the things he had in his mind to see to on his return to the Rand. The doctors he employed for natives in the compounds should devote the whole of their time to this work, and that was one of the things he would take actively in hand directly on his return. Sir Lionel pointed out that in regard to the question of dealing with tuberculosis they were awaiting the report of the Commission. It was to every one's interest, apart from the humanitarian point of view, that the best possible health conditions should exist on the mines. In conclusion, Sir Lionel Phillips said he would be one of the last persons to object to the acceptance of a motion by which the Government would have a Commission of expert advice, and all information desired would be obtained in regard to health conditions on the mines. From all this it will be seen that neither the Government nor the mining groups are relaxing their efforts in the fight for better health conditions and that wonderful progress has already to be recorded.

THE HALF YEAR'S DIVIDENDS.

Earnings for the Six Months—Probable Distributions Indicated.

RAND dividends for the first six months of the current year have not been announced with the accustomed celerity usually so noticeable at this time of the year. This, we understand, is due to a very reasonable desire on the part of the controlling mining Houses to see what further developments attend the strike movement on the East Rand. But for this unfortunate feature the list would have by this time attained to very impressive and satisfactory proportions. As it is, shareholders must rest content in the knowledge that the "sinews of industry" necessary for distribution of sums which will compare most favourably with those announced for previous half years have been earned, and the only thing necessary for their declaration is a slightly more favourable time than the present. In the absence of official dividend declarations we give hereunder the following brief table, which shows at a glance the estimated working profits for the current half-year of thirty-six Witwatersrand mines; also comparisons of the dividends for the last three half-years:—

Company.	Current half-years' profits estimated.	Per cent. of earnings to issued capital.	Dividends. 1912. Dec.	1912. June.	1911. June.
Bantjes	£27,616	6¼	6¼	5	—
Brakpan	176,773	23½	25	15	—
City and Suburban ...	117,355	8½	7½	7½	5
City Deep	150,000	12½	12½	—	—
Cons. Main Reef ...	60,140	6½	5	5	3¾
Crown Mines	679,295	72½	55	55	55
Durban Deep	35,905	8½	5	5	—
East Rand Proprietary	470,000	19	12½	12½	20
Geldenhuis Deep ...	79,753	13½	5	10	17½
Ginsberg	35,524	17½	17½	15	10
Glencairn	14,477	2½	5	—	—
Jupiter	23,967	2½	2½	2½	—
Knight Central ...	19,605	2½	—	—	—
Knight's Deep	96,000	15	10	12½	17½
Langlaagte Estate	81,135	9	10	5	10
Main Reef West ...	30,000	6	5	7½	10
May Consolidated	22,021	7½	10	15	20
Meyer and Charlton	99,000	19½	35	25	20
Modder B. ...	180,870	26	20		—
New Goch	18,000	3¼	—	—	7½
New Kleinfontein	138,150	14	5	7½	10
New Modderfontein ...	260,553	18½	15	12½	11¼
New Primrose ...	102,000	31½	30	25	20
New Unified	27,094	11	10	10	5
Princess Estate ..	11,367	2	—	—	5
Randfontein Central ...	365,000	9	5	—	—
Robinson Gold ...	343,008	12½	10	12½	15
Robinson Deep	140,000	14	12½	15	15
Rose Deep	205,728	29	22½	22½	20
Simmer and Jack Prop.	212,751	7	7½	7½	10
Van Ryn Estate	133,044	26½	22½	22½	22½
Village Deep	129,032	12	10	7½	5
Village Main Reef ...	185,897	39½	35	35	35
West Rand Cons. ...	25,500	1¼	—	—	—
Witwatersrand Deep ...	107,894	19½	12½	12½	25
Witwatersrand Gold ...	121,138	29	17½	17½	17½

It is perhaps hardly necessary to explain that the second column must not be taken to represent the probable distribution, since from the current half-year's profits deductions on account of profits tax, etc., have to be made.

THE POSITION OF S.A. GOLD MINES, LTD.

Finances and Shareholdings Reviewed.

SPEAKING at the annual meeting of the S.A. Gold Mines, Ltd., this week, Mr. Julius Jeppe said, *inter alia:*

You will remember that in November, 1908, you authorised your directors to issue 5 per cent. first mortgage debentures to the account of £308,000; redemption of these debentures had to commence in 1913, but your directors had the right to redeem prior to that date at a premium of five per cent. Under ordinary circumstances, we would have been obliged to redeem £30,800 of debentures on December 31 this year and continue such annual redemption for ten years; your directors, however, considered it a wise policy to purchase debentures in the open market whenever a favourable opportunity offered; this policy received the support of our shareholders at successive general meetings, at each of which they were made acquainted with the number of debentures purchased during the year then under review. In this way we have reduced our debenture debt from the said £308,000 to £77,000 at the end of 1912, and to £62,000 at the present time. At no time have we paid more than par value for the debentures. The total profit which this company has derived from these purchases is nearly £6,000. Obviously, the money utilised for the purchase of these debentures was obtained by the sale of shares, but in this policy we were well advised, as we could now buy the shares back at the same price as we sold them for. Roughly, the position is that during the year under review we reduced our total liability by £61,000, against which we reduced the book value of our assets by only £24,000. Unfortunately, however, we were obliged to write off the sum already mentioned for depreciation, the principal losses in this direction being the depreciation of our claim property and that belonging to our subsidiary companies. As has been stated in the directors' report, the mining results in the vicinity of the greater portion of your claim holdings have been so disappointing that we deemed it advisable to write down the value of some of your claim holding, which was immediately affected, by 50 per cent., and we must anticipate a further loss in this direction, which, however, is not likely to exceed £12,000 or £13,000; on the other hand, the provision we made in reducing the value of shares in your subsidiary companies to the actual cash values has been ample, and we need not fear any reduction in these values, and may rather hope for an appreciation. You will have noticed that the disposal of the shares I have already alluded to has not affected your receipts from dividends to any appreciable extent, the difference between the amounts received in 1912 and 1911 being, roughly speaking, £1,700. As far as it is possible to gauge, you will during the current year receive the same amount in dividends that we have in the past, whereas our expenditure will be reduced on account of the smaller amount of debentures we have to pay interest on by £1,250. Your attention has already been drawn to the fact that the loans from subsidiaries amounting to £83,000 need not cause you any anxiety, since the only chance of these loans being called up would be in case of these companies being liquidated, and in such an event the whole amount would be paid back to you in liquidation dividends. A list of your shareholdings is upon the table, for the inspection of shareholders, and a copy of the list will be forwarded to London for the same purpose there. I now beg to move that the directors' report and accounts for the year ended December 31, 1912, be adopted.

Wolhuter G.M. Co.

The operations for the quarter at the Wolhuter Gold Mines resulted in a profit of £30,633 (7s. 5.768d. per ton). The revenue amounted to £106,671 (26s. per ton), the working expenditure to £76,038 (18s. 6.822d. per ton), and the capital expenditure to £6,613. Ore developed or exposed during the quarter (including ore mined from development):—Assumed payable tonnage, deep level, 41,414 tons, assay value 5.55 dwts. over 52.7 ins.; east incline, 20,969 tons, assay value 6.32 dwts. over 49.7 ins.; mynpacht, 5,072 tons, assay value 6.22 dwts. over 47.8 ins.; total, 67,485 tons, assay value 5.84 dwts. over 51.4 ins. Assumed unpayable tonnage: Deep level, 11,971 tons, assay value 2.78 dwts. over 48.0 ins.; east incline, 8,499 tons, assay value 2.86 dwts. over 55.1 ins.; total, 20,470 tons, assay value 2.81 dwts. over 50.7 ins. The payable ore reserves at date are 804,229 tons, valued at 6.35 dwts. over 50.7 ins.

PROLONGING MINE LIVES.

Banket Beds to be Worked to an Indefinite Depth—Mr. Schumacher's Significant Remarks.

CERTAIN remarks made by Mr. R. W. Schumacher at the annual meeting of Rand Mines, Ltd., held on Wednesday, have such a very important bearing on the subject of mine lives that we may devote special consideration to this aspect of his speech in a separate article. The dominating positions of mines owning claims extending for a very considerable distance from outcrop in a southerly direction has on a previous occasion been dealt with in this journal. A glance at a map of the Rand will show that a number of outcrop and deep level companies own ground which contains reef down to a probable depth of 7,000 feet. Obviously, the areas lying to the south, that is to say the still deeper areas can only be advantageously worked by the companies whose claims lie to the north. Even under the most favourable circumstances it could scarcely pay any concern to sink shafts to a depth of 7,000 feet or more. Two large shafts of this nature would probably cost close on £600,000, and the additional sums required for development and equipment would be enormous. But it is quite conceivable that these deeper claims will in the course of a few years be profitably worked by mines owning property adjacent and nearer outcrop through extensions of incline shafts. Indeed, we believe that to-day the larger mines could work 6½ dwt. ore lying at a depth of 7,000 feet at a profit, were shafts down to such a depth. The Chairman of Rand Mines, Ltd., was, however, speaking of the future when he made certain remarks concerning subsidiaries.

NOURSE MINES AND CITY DEEP.

We will first of all take Mr. Schumacher's references to this all-important subject *serialim*. At the Nourse Mines meeting, Mr. Schumacher said: "The unworked area of this property is very considerable, and as the claims immediately to the south belong to our company, the Rand Mines, Ltd., there should be no trouble in extending the life of the Nourse Mines, Ltd., in due course." At the City Deep meeting he stated: "The unworked area of this property amounted to 1,068 claims at the 31st of December, 1912. It is estimated that the reef will attain a vertical depth of approximately 7,000 feet before it leaves the company's southern boundary. In the circumstances, it seems natural to assume that the open claims to the south which belong to the Government will eventually fall to this company that will thus be able to follow the reef to the final depth at which it proves payable. The life of the mine will, in any case, be very long."

VILLAGE DEEP AND TURFFONTEIN ESTATES.

At the Village Deep meeting Mr. Schumacher pursued the subject in the following words: "The total unworked area is large, and it is reasonable to assume that the present operations can be extended eastwards towards the City Deep and eventually southwards by arrangement with the Government, who are the owners of the mineral rights under these adjoining stretches of ground. The life may, therefore, be regarded as of great length." The Chairman's remarks in regard to the Turffontein Estates, Ltd., should also be considered here, since this ground lies to the south of the Village Deep property: "I must inform you that during the present year we have strengthened our interest in the Turffontein Estates, in which we now hold 19,520 shares out of an issued capital of 50,000 £1 shares. You will remember that I told you last year that the whole of the deep level ground on Booysens and South Deeps which lies to the south of the Robinson Deep and the Grahamstown dyke, as well as the whole of the mining area to be obtained on Turffontein in the form of mynpachts and otherwise, is, by arrangement, to come under the control of the Rand Mines, Ltd., and the Central Mining and Investment Corporation, Ltd. In other words, we and the Village Deep control the whole of the extensive deep level area in the central and perhaps the richest portion of the Rand situated between the Crown Mines on the west and the City Deep on the east."

SIGNIFICANCE OF THE STATEMENTS.

What do these words signify? They mean that the mines mentioned above can prolong their lives indefinitely. Mr. Schumacher used the phrase "follow the reef to the final depth at which it proves payable," and Mr. E. J. Renaud, who seconded, said: "Developments at the lowest levels of practically all the mines show, as pointed out by the Chairman, very good values, thus reducing to nothing, as far as our mines are concerned, the theories advanced by many outside critics to the effect that the value of the reef diminishes at depth. Of course, we cannot see through the rock, but, considering that some companies are at present developing their property at a depth of over 4,000 feet, with very high values, we are justified in hoping that these values can be expected to continue to the limit of depth at which it will be possible to work these huge deposits at a profit." What that limit will be it is obviously impossible at this juncture to say, as so many varying factors have to be taken into account. But it seems that a depth of at least 7,000 feet is regarded as no barrier to profitable work, and hence the companies mentioned and several others too will be able to prolong their lives indefinitely. One might, in fact, say that in regard to certain Witwatersrand mines there is virtually no limit—no limit determinable to-day at any rate—to the period of duration of profitable operations, and the life factor is one of much smaller importance than it generally is realised to be. In these deeper level sections the reef lies at a much flatter angle of dip—save in one or two exceptional places—and this, of course, makes for a lesser tonnage per claim than in the case of reef lying nearer outcrop and with a steeper dip. But, despite this, these deeper level sections, by reason of their extent, contain many million tons of banket. Difficulties will, no doubt, have to be faced in connection with the exhaustion of these ultra deep areas, but they are scarcely likely to be insuperable; in fact there is no hindrance whatever so far as can be seen at present, to working ore at a profit at an even greater depth than 7,000 feet, provided ore of a value similar to the average worked on the Rand is encountered. There is, too, every reason for believing that this value will be maintained.

Swaziland Tin.

The following are the particulars in regard to operations for May at the Swaziland Tin Mines:—Concentrates recovered, 42·072 long tons; estimated profit (taking the price of tin at £200 per ton), £3,582; adjustments in respect of previous shipments due to fluctuations in the price of tin, to be added, £819; profit for the month, £4,401. The new gravel pumps are expected to commence working on June 24.

Luipaardsvlei Estate.

The directors of the Luipaardsvlei Estate and Gold Mining Company have issued a circular stating that in view of the satisfactory position of the ore reserves the general manager has recommended the erection of two more tube mills, which will have the effect of increasing the crushing capacity from 16,500 tons to 21,500 tons per month. The capacity of the existing stamp mill is sufficient for the enlarged tube mill equipment. The board have given instructions to proceed with this work at once, and it is expected that the new tube mills will be in operation in January next. The cost of the new plant will be paid out of profits. The general manager advises that when the larger tonnage is being crushed a reduction in working expenses may be expected, which should result in a corresponding increase in the company's profits.

THE MANAGER AND STAFF OF THE WIT. DEEP GOLD MINING COMPANY, LIMITED.

Back Row (from left to right): F. H. Branson, clerk; A. M. Murdoch, assistant surveyor; P. K. Dixon, European timekeeper; T. H. Oates, foreman timberman; C. J. McDonald, store assistant; R. Burns, shiftboss; A. J. J. Smart, chief electrician; E. R. Pooley, acting surveyor; D. Behrman, assistant surveyor; J. Finnie, shiftboss.

Middle Row: J. A. Armstrong, shaft clerk; A. H. Winton, draughtsman; J. A. Grant, drill contractor; B. Hoyer, shiftboss; A. S. Gunning, assistant assayer; R. A. Thompson, caretaker; A. Lichtenstein, shiftboss; S. H. Northey, foreman fitter; S. O. Ertshus, storekeeper; C. Sinclair, cyanide foreman; J. F. Stone, surface foreman; A. Slater, foreman pumpman; G. Adams, foreman pumpman; O. J. Roberts, boiler foreman.

Front Row: J. Magor, shiftboss; W. H. Gribben, shiftboss; M. H. Reid, cyanide manager; F. T. Chapman, assayer; R. A. Dunster, mine foreman; P. E. Foster, mine secretary; F. E. Hardie, manager; W. Thomas, engineer; S. Smith, chief clerk; F. de Marillac, shiftboss; C. F. MacKinnon, shiftboss; W. Gleghorn, foreman smith.

Sitting: W. E. Sinclair, sampler; H. van der Merwe, sampler.

NEW MODDER AND ITS FUTURE.

Pushing on Development—Reef of High Value Exposed—Increasing Profits.

New Modderfontein profits last month were at the rate of £576,000 per annum, there being milled 52,250 tons for a total recovery of 23,217 ounces, with costs at 19s. 3d. per ton. As we have often remarked, few propositions possess such potentialities as this, and it is certain that within the next few years the profits of this mine will be very largely increased. With a wise conservatism, the board of management is awaiting developments over a considerable stretch of reef in the huge and practically unexplored eastern section of the mine (the section which the new central shaft is designed to attack) before giving effect to any policy of expansion in regard to reduction operations. This at any rate is the interpretation we put upon the remarks made by Mr. F. Eckstein at the Central Mining and Investment Corporation meeting, held in London the other day. Mr. Eckstein said: "As to the New Modderfontein, I can only say that the present thoroughly satisfactory results and profits show the real intrinsic value of this great mine. In the central part of this property a circular shaft has been sunk, which struck the reef about six months ago, giving good assay results. This circular shaft is a new departure in Rand practice, and is designed to allow for rapidity of hoisting and increased air supply to the underground workings. The board of this company is now actively developing this portion of the mine, and if a large tonnage can soon be exposed and the values remain as satisfactory as they now are, I expect the directors will have to consider the advisability of materially increasing the stamping power of this concern." These remarks, coming from the Chairman of the great Corner House Corporation, tempt one briefly to enquire into the more recent performances of this company, more particularly in regard to development. In the last financial year of the company—twelve months ended June last—the development operations resulted in the following footages: Drives, 7,806 feet; winzes and raises, 7,457 feet; crosscuts, 3,483 feet; incline shafts, 535 feet; sundry ore chutes, etc., 1,220 feet; No. 2 vertical shaft, 197 feet; circular shaft, 1,167 feet: total, 21,865 feet. Of the above footage, 14,378 feet, or about 65·8 per cent., was in reef formation, the reef disclosures in which were as follows:—Main Reef: Distance exposed, 14,378 feet; width, 10 inches; assay value, 186s. 1d. The estimated payable tonnage developed was 981,935 tons. Development operations for the quarters ended September, December and March were:—

	Total Footage.	Reef Disclosures.				
			Distance Exposed.	Width inch.	Assay value. s.	d.
September quarter ..	3,709	Main Reef	2,347	10	196	7
December quarter ...	3,267	Main Reef	1,843	14	129	4
March quarter	4,720	Main Reef	3,116	9	195	11

The much larger footage achieved in the March quarter than in the other two three-monthly periods is very noticeable, and we understand that this rate of development is being maintained. The excellence of the reef assays is noticeable. The width is, however, very narrow. It may be remembered that at the end of last year the ore reserves amounted to 4,057,000 tons of a value of 8 dwts. per ton. It may be recalled, too, that at the last annual meeting Mr. R. W. Schumacher said of the future development policy:—

> Our plan is to hurry on the connection between the circular shaft and the No. 12 incline shaft at the greatest possible speed. The No. 12 shaft is now being sunk at the rate of over 200 feet per month, the dip of the reef being 15 degrees, and there remains a distance of approximately 2,000 feet to cover to effect the connection. We are making preparations to raise to meet this incline shaft from the bottom of the circular shaft, and it is hoped to connect by the middle of 1913. After the junction with the circular shaft has been made there will be a distance of 4,000 feet of virgin incline at No. 12 shaft below the lowest existing stoping levels, and it is obvious that the scope for rapid development from this shaft will be enormous. Given a reasonable supply of native labour we shall be able to block out large areas of ground in a comparatively short period of time. We shall thus gain knowledge which will help us to frame our policy for the future, and, at the same time, be paving the way for crushing on a larger scale as soon as the time is ripe. We shall naturally be developing simultaneously also in other sections of the property, including the western area.

PROSPECTS OF LEEUWPOORT (AFRICAN FARMS) TIN MINES.

Strong Ore Reserves—A Modern Equipment—Chairman's Review.

The position at the Leeuwpoort mine is fully set forth in the annual reports issued this week. The Consulting Engineer's report for the ten months ended 31st December, 1912, states:—Mr. Jameson, the manager of the property, has given in detail the work accomplished for the ten months ended 31st December, 1912. The figures given in his report under the heading of "Summary of Ore Reserves," as at the end of the year, differ slightly from my report made on the 12th February, 1913. The fact that his calculation and the independent one made by me agree so closely is only an assurance that this work has been carefully carried out in both instances. At the time of my compilation the various dumps had not been fully measured up and sampled, so that the figure of ore at grass has been increased from 21,172 tons, having an unsorted value of 1·16 per cent., to 29,795 tons, having an estimated value of 1·26 per cent. A certain addition has also been made to the ore developed in the Quarry Workings, viz., 5,697 tons, which brings the present milling tonnage to 110,519 short tons, valued at 2·26 per cent. metallic tin. As Mr. Jameson points out, the development at the H. G. Workings continues to be most promising, and there is no doubt but that the high grade ore from this section has been included in the ore reserves at a conservative figure. Good progress is being made in the construction of the reduction plant, and, although there may be unexpected delays, there is every hope to start the plant during the month of August.

The Mine Manager's report for the ten months ended 31st December, 1912 (also embodying results of development work for January and February, 1912, previous to flotation) states, *inter alia*:—

> Mention is also made of the progress during the previous two months (January and February, 1912), before flotation, which were briefly referred to in my last annual report. The total development and exploratory work accomplished during the ten months from the 1st March, 1912, was 10,153 feet. Included in this total is 245 feet of Main Shaft sinking. Appendix No. 1 (attached) gives further particulars with regard to this work. The average monthly footage for the period was 1,015.3 feet. The greatest amount of development work has been done on the Southern Extension of the Spruit Lode, viz., 2,671 feet, equal to 267 feet per month. The most satisfactory development results have been achieved at the H.G. and Southern Extension workings. The total cost of development and exploration, exclusive of Main Shaft sinking, was £17,492 4s. 8d., equal to £1 14s. 3d. per foot. No sinking was done at either Spruit or Nek Main Shafts during the period under review. Shaft sinking at the Spruit, West and H.G. Workings will be vigorously continued during the ensuing year. It will be possible to continue the first three-mentioned Main Inclines to a depth of 1,000 feet with the present equipment, should it be desirable to do so. The total cost of shaft sinking, including the re-grading, re-conditioning, and equipment, was £1,676 7s. 4d. In addition to the payable ore bodies located at the above five workings—two additional sections exist, viz.:—(1) New Strike Area, (2) Quarries Workings. No further work has been done during the year at these last-named open cast workings. Further exploitation will only take place when milling is in progress, and will take the form of benching down the payable area, which will be sent direct to the mill as it is broken at the working places. A total vertical depth of 45 feet was reached at No. 1 Quarry—the bottom

still showing good values. At the New Strike Area several promising lodes have been located during the year, but sufficient work has not yet been accomplished to determine their probable ultimate value. The feature of this area is the exceptionally high grade value of several of the various outcrops; eight short tons (which have been bagged) averaged 58 per cent. Met. Tin. A total of [illegible] short tons of payable ore, obtained within this area, has been grassed during the year.

Exploration and Prospecting—Rietfontein, No. 910.—The portion of this Farm (about ¼ portion) adjoining Leeuwpoort on the north east included in the Leeuwpoort (African Farms) Tin Mines, Limited, flotation, was prospected to a limited extent for a few months at the beginning of the year. Several promising fissures were located. It was also ascertained that a large area of alluvial ground exists from the grass roots to bed rock in the vicinity of the fissures mentioned. Further work on this portion of the property has been left in abeyance for the present, owing to the magnitude of the work involved in the preparation of the Main Workings for milling operations. The alluvial ground mentioned will be considered in conjunction with the known extensive area existing in the valley near the Main Workings on Leeuwpoort itself. The probable available water supply (after milling and other requirements habe been met) is the first consideration in dealing with this question.

Ore Reserves.—An estimate of the milling ore developed, exposed, and at grass at 31st December, 1912, is as follows:—(1) Total ore at grass, 29,795 short tons, 1.26 per cent. value metallic tin; (2) total ore exposed-developed, 80,721 tons, 2.62 per cent. value metallic tin; total, 110,519 short tons, 2.26 per cent. value metallic tin. An average percentage of 8 per cent. sorting has been allowed for on this tonnage—the assumed percentage of sorting from the ore from the individual workings varies between nil at H.G. Workings to 20 per cent. at the Nek Workings. In view of the irregular occurrence of the deposit at H.G. Workings, the actual figure for ore developed at this point will probably be found, on actual stoping, to be under-estimated. In addition to regular lodes, "supplementary fillings" have been located at several points. Owing to the comparatively high grade of the ore, and to the large tonnage exposed, this working has, during the year, proved to be one of the most valuable workings on the property.

Reduction Works.—Preliminary plans and estimates for a complete power plant, reduction plant, tin dressing and slimes plants were started at the beginning of the year. Mr. Seymour Ward was appointed Construction Engineer (January, 1912) to superintend this work. The designs have been framed to provide for the milling and concentrating of 150 short tons per diem. Construction work was started about the middle of November, 1912. Satisfactory progress has been made to date. Some special features in connection with the tin dressing plant are:—(1) The provision of efficient and very complete classification in series before concentration (in the form of Richards-Jauney Classifiers) for both Wilfley, and Buss, and also Frue Vanner Feeds; (2) adequate primary treatment of fines, slimes, after classification, on Isbell Frue Vanners (10 in number), with Rag Frames, Round Frames, and Acme Tables as secondary concentration only; (3) the installation of a notably short tube mill, employed for regrinding the bulk of the middlings, with a secondary regrinder (Huntingdon Mill) for separate higher grade middling products, to bring sliming and consequent losses to a minimum; (4) installation of a Dorr Thickener as a more efficient and economical dewaterer than a number of separate small units scattered about the mill; (5) the installation of two Nissen stamps in conjunction with the Californian stamps (both of comparatively light weight). A comparison of the efficiency and non-sliming effect of these two types of stamps on tin ore will be possible.

At the annual meeting of the company, which was held last week, Mr. Julius Jeppe presided and said, *inter alia*:—

As your directors did not deem it advisable to exceed the amount at their disposal, a policy of development was agreed upon between the consulting engineer, the mine manager, and ourselves, which policy is now being carried out, with the result that when we commence regular milling in September, we will have paid for the entire mill and all the expenditure at the mine and head office, with, perhaps, the exception of a few thousand pounds. To attain this object, however, we were obliged to curtail to a considerable extent the further development on some of our mines, and therefore we chiefly devoted our resources to the Spruit Mine and the H.G. Mine, with most gratifying results. Our consulting engineer has furnished us with a report on your property up to May 31, 1913, which report lies upon the table; I quote the following from it:—"The development work at the Spruit workings has been most satisfactory, the shaft having reached a depth on the incline of 652 feet. At that point 7½ inches of lode matter gave a value of 13.1 per cent. metallic tin. The lode is well defined, with a very distinct footwall. Although this value is given to show the encouraging nature of the lode at the lowest point reached, it is, at the same time, of interest to note the fact that for the last one hundred feet in this shaft the average value is 6 per cent. over 15 inches. The third level, at a depth of 475 feet, shows good results, and the fourth level has just been started at 625 feet." And to this I would personally like to add that these excellent results obtained at this depth should dispel the fear expressed in some quarters that the tin-bearing lodes do not carry values at the lower depth; the fact that values in this reef have gradually but consistently increased from the surface to the present depth must be a source of considerable gratification to our shareholders.

H.G. WORKINGS.

Mr. Thomson further refers in his report to the H.G. workings, where we have increased our ore reserves by 3,735 tons, value 3.[illegible] per cent. This particular mine differs considerably from the other workings on your property, inasmuch as in addition to several well defined lodes, "supplementary fillings" have been located in the form of large irregular pockets of high-grade ore, and the fact that within a comparatively short time we have been able to grass and develop from this mine alone over 2[illegible] tons of ore with an average value of 3 per cent. certainly justifies the assumption that it will prove one of our most profitable mines. I do not think it necessary to specifically refer to any of the other mines or workings enumerated in Mr. Jameson's report, especially as comparatively little work has been done on these since that report was written, but I can state that the nature of the work that has been done on them has been entirely satisfactory. I may, however, be permitted to allude to the latest discovery, namely, the new strike workings. Mr. Jameson, in his report, alludes to these, and at that time he was not justified in taking anything into his ore reserves except the 110 tons at grass. Since then a drive at the bottom of the 80 foot shaft has shown payable values over a distance of over one hundred feet, developing 720 tons, with a value of 1.66 per cent. Considerable quantities of water, however, were met with in this shaft which prevented, for the time being, further sinking, but it is the intention of the management to speedily erect steam haulage and pumping gear here, which will enable them to continue the shaft and develop what they hope will turn out to be another very profitable mine.

ALLUVIAL DEPOSIT.

In addition to the exploited lodes on your property, valuable alluvial tin has been located both on Leeuwpoort and on your portion of Rietfontein. An estimate of the deposit on Leeuwpoort alone shows about 2½ million cubic yards of an average value, approximately, of 2s. 2d. per cubic yard, with metallic tin at £208 per long ton, representing a gross value of £282,000. There is, besides, a considerable deposit on the company's portion of Rietfontein, the testing of which has been left in abeyance. Obviously, the entire question of working these alluvial areas will soon have to be considered by the directors, but cannot be taken in hand until provision has been made for the water required for this purpose.

PROSPEROUS FUTURE.

Now, gentlemen, I think you will agree with me that the position of our company is one justifying the expectation of a prosperous future. According to Mr. Thomson, the mill will commence crushing some time in August, but allowing for the one or two months necessary to adjust and condition a concentrating plant such as is required for the treatment of tin ore, it will be best, during the initial period, to treat the lower grade ore. I think, however, that we can look forward to commencing normal crushing of the average ore during October next. The mill, as you know, is designed to crush 4,500 tons a month; the ore reserve is about twenty-seven months ahead of the mill, and we have every reason to expect that we will maintain this margin. It is naturally impossible to predict what profits will be realised, since the price of tin is a fluctuating quantity. All I can say is that the profit already in sight is of considerable magnitude, and that the condition of things on your property justifies the anticipation of handsome dividends being distributed before we meet again at the next general meeting.

Nourse Mines.

The directors' report of the Nourse Mines, Ltd., for the two months ended 31st March states, *inter alia:* The total working expenditure was £111,603, equal to 21s. 8d. per ton milled; and the working profit £49,385, equal to 9s. 7d. per ton milled. Number of feet driven, sunk and risen, exclusive of stopes, 5,301 feet. The reef disclosures were as follows:—Main Reef: Distance exposed, 555 feet; width, 40 inches, assay value, 36s 4d. per ton. Main Reef Leader: Distance exposed, 915 feet; width, 16 inches; assay value, 58s. 10d. South Reef: Distance exposed, 1,415 feet; width, 18 inches; assay value, 73s. 1d. Ore received from mine, 121,150 tons; waste sorted out, 15·8 per cent.; tonnage crushed, 103,000 tons; number of stamps operating, 260; number of tube mills operating, 7; mill yield per ton, 23s. 10d.; assay value of pulp, 9s. 1d.; total, 32s. 11d.; total yield, 38,315 ozs. fine; total yield per ton, 31s. 3d.; accumulated slimes, tonnage treated, 2,315 tons; accumulated slimes, yield 355 ozs. fine. Development operations for the two months constituting the period resulted in a total footage of 5,301 feet, as compared with 6,803 feet for the previous three months. Development generally is being energetically undertaken, and three incline shafts are now being sunk. All development is charged to working costs, with a minimum figure of 3s. per ton milled, so that working costs are affected by an increased footage. A new change house for tropical natives has been erected at the South Nourse. The railway connection and other work for hauling rock from No. 2 South Nourse shaft to the mills will soon be completed. The total number of natives in the company's service at the end of March was 4,8[illegible]3. The expenditure on equipment for the two months has amounted to £1,058. A further amount of £8,200 will be required to complete the present capital expenditure authorised.

ORIGIN OF GOLD IN THE BANKET.

A Fascinating Subject Revived—The Four Theories Discussed.

OUR valued American contemporary, the *Mining and Scientific Press*, of San Francisco, has revived discussion on the origin of the auriferous conglomerates of the Witwatersrand, and in its issue to hand by this mail contains a translation from the new edition of the second volume of "Science of Ore Deposits," by R. Beck, on the subject. Opinions regarding the origin of the Rand gold deposits—certainly the largest and most extensive in the world—still differ considerably, and the subject is always worthy of discussion, since it has a decided economic significance as well as high academic value. Our contemporary, quoting from the new edition of the important geological work mentioned, states four principal theories have been adduced. The theory of the purely mechanical distribution of gold in its present condition is summarily dismissed. As to the theory of the purely chemical precipitation of gold and pyrite in the sea, the objection advanced is contained in the remark: "Recently the possibility of a precipitation of such a very small amount of gold as is contained in sea water has . . . been seriously questioned. In regard to the third theory, *i.e.*, that of former placer in which the gold has subsequently been re-deposited, the question is asked: "But why is ilmenite so characteristic of marine placer conglomerates absent?" As to the fourth theory, the theory of the subsequent transportation of gold to the conglomerates, it is remarked:—

The view, well worthy of consideration, which, rightly described, has also been called the theory of subsequent mineralisation and enrichment of the conglomerates, has been specially defended by E. Dorsey, A. R. Sawyer, Gardner F. Williams, J. S. Curtis, J. Kuntz, K. von Kraants, P. Krause, John Hays Hammond, F. H. Hatch, G. S. Corstorphine, and R. B. Young. It can be described as the prevailing view in the circle of Johannesburg mining engineers. The assumed subsequent penetration of auriferous solutions is connected with the eruption of diabase. The pyrite, according to this theory, is considered as primary and at the same time as a precipitating material of the gold, as actually demonstrated by Johansson and Liversidge, who obtained a precipitation of gold in very dilute solution of chloride of gold through pyrite; or at least the precipitation of pyrite occurred a little sooner than that of the gold. It certainly cannot be proved that the amount of gold is proportional to that of the pyrite. There are even highly pyritical lodes without gold. Hatch and Corstorphine have therefore suggested organic substances which actually occur in the conglomerates as a precipitation medium. I have already mentioned, however, that these are not generally present. The uneven distribution of the gold within the conglomerates and the occasional enrichment of the lodes in the vicinity of eruptive masses favour the infiltration theory. The fact that elsewhere in the Transvaal, in the Lydenburg district, undoubted sediments, here dolomite of the Malmain horizon, have been mineralised through solutions which deposited quartz and gold, together with copper, is corroborative of the infiltration theory. The observation that in a much higher geological horizon, that of the Black Reef, the auriferous character of a conglomerate is repeated, also the absence of a constant horizon of ore deposits of this nature, is favourable to the theory. The principal objection to this theory should certainly not be passed over; namely, that only single layers, not all conglomerate reefs, are found impregnated with gold, that therefore no equal impregnation zones run through all layers of the Witwatersrand along fault planes or dykes. Against this the originally unequal porosity of such rock layers should be pointed out. Thus it appears that the cement of those beds known as poor, like the Main Reef, Elsburg, Bird, and Kimberley Reef, have become denser through a larger admixture of finest quartz sand than the other richer reefs. When apparently porous layers, such as the breccia like "Bastard Reef" below the Main Reef Leader in the New Goch mine (J. W. Gregory) is found poor in gold or with gold absent, this is certainly remarkable. Yet the question is whether this condition has not been occasioned by later removal of cement.

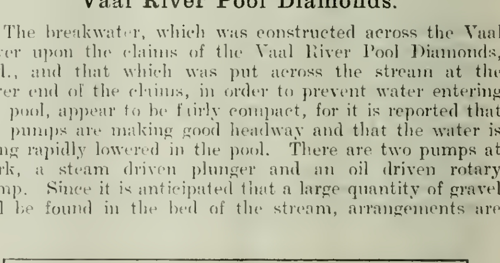
OBJECTIONS TO INFILTRATION.

A statement frequently brought forward against the infiltration theory is the view that channels are absent. J. Kuntz has meanwhile (1908) pointed out that south of Greys Mynpacht on the West Rand auriferous quartz veins were formerly worked, and that possibly such poor reefs have frequently occurred but been little observed. Also an auriferous diabase dyke with up to 2 gm. to the ton is known at the Meyer and Charlton and the City and Suburban. I also noted an apophysis in the conglomerate which was projected from a diabase dyke which intersected it. This offshoot was full of visible free gold, and even the South Reef was enormously rich at the immediate contact (over 6.000 gm. per ton). The diabase mass had in part replaced and filled the interstices between the pebbles. Much more numerous, according to J. Kuntz, are instances in which non-auriferous diabase dykes or faults have exerted a visible enriching influence on the conglomerates in contact on either side. Such an enrichment is known, for instance, in connection with a diabase dyke at the Princess Estate and at the fault in the Bird Reef group of the Van Ryn and Chimes mine. In the latter case the enrichment extended for 200 metres on either side. The most important argument for the infiltration theory is certainly the dependence of the value of the gold in the conglomerates on their dip, as has been lately demonstrated by J. Kuntz, who has practised on the Rand for many years. The steeper the dip of the conglomerates, the stronger have they been compressed and the more faulted they have become. This accounts for their greater gold values in comparison with the undisturbed reefs which are slightly or not at all inclined. "Compare," wrote J. Kuntz (1908), "the gold values in the reefs of the mines lying in relation to depth below one another, Ferreria, Ferreira Deep, Robinson Deep, and Turf mines, in the Central Rand; Champ d'Or, French Rand, and Tudor in the West Rand, or the several Knights mines in the East Rand, with the results obtained in the deepest boreholes, and it will be found how clearly this appears to be the case." The deeper the reefs, the flatter and more undisturbed are they known to occur. That this rule is not without exception is shown in the tables of F. W. Voit and Kessler.

As to this latter view, we would ask to what extent recent developments on the Further East Witwatersrand have influenced Mr. Kuntz's theory. To the east of Boksburg the conglomerates are much flatter than on the Central section and particularly so on Modderfontein. But at the same time it cannot be denied that in this portion of the Rand there are zones which in point of richness of gold contents compare most favourably with some of the best stretches on the Central Rand.

Vaal River Pool Diamonds.

The breakwater, which was constructed across the Vaal River upon the claims of the Vaal River Pool Diamonds, Ltd., and that which was put across the stream at the lower end of the claims, in order to prevent water entering the pool, appear to be fairly compact, for it is reported that the pumps are making good headway and that the water is being rapidly lowered in the pool. There are two pumps at work, a steam driven plunger and an oil driven rotary pump. Since it is anticipated that a large quantity of gravel will be found in the bed of the stream, arrangements are being made to convey all the material to the bank as soon as possible. A couple of small hoisting engines, with the necessary trucks, will be employed, and possibly an aerial gear if tramming proves inconvenient. A washing plant is being designed for the purpose of treating the gravel rapidly. It will comprise a trommel classifier, followed by Cox gravitators, with a rotary machine as a stand-by for clayey ground. Some excellent finds have been made in the shallows above the pool at various times, and a plentiful harvest is anticipated by the company.



DAM OF THE VAAL RIVER POOL DIAMOND SYNDICATE.

AN AUSTRALIAN VIEW OF THE RAND.

Mining Systems and Imitative Metallurgy—A Visitor's Impressions.

An article appearing in the *Mining and Engineering Review* of April 5th last, which has been forwarded to us by a London correspondent, calls for some mention and criticism, since it contains one or two statements concerning Witwatersrand mining and metallurgical practice which cannot be allowed to pass unnoticed. The article is entitled "Impressions of the Rand," and the author is Mr. W. Motherwell.

An introductory paragraph states: The writer of the following notes left Australia for the Rand to gain a wider experience in mining and milling methods, and his impressions, whilst they may not apply generally, are still of interest, as showing how things are done on some of the most up-to-date mines there. Mr. Motherwell summarises his impressions as follows: "The things that struck me most were: (1) The huge scale on which mining and milling operations are carried on; (2) the inefficiency of the coloured labourer; (3) the way in which the 'bosses' chase up the men under them; and (4) the old-fashioned nature of most of the cyanide plants for the treatment of slimes."

He next proceeds to quote from this paper, and writes: "The following remarks from the *South African Mining Journal* of 20th January, 1912, show that even South Africans are aware of the present unsatisfactory state of affairs: 'The New Spirit in Rand Mining.—It will be remembered that it is not so long since the industry woke up to the economic advantage of what in the United States is termed "the square deal" with the workmen. It may be, of course, that the reason for the amelioration is to be found simply in the new ideas and new blood recently introduced into the counsels of the industry.'"

Since that view was recorded in the columns of our journal much additional attention has been paid the subject, and there has been further evidence of a genuine and thoroughly sincere desire on the part of the mines to improve the lot of workers. Mr. Schumacher's remarks at the Unionist Party Club on the subject of the miner's welfare will be fresh in the minds of our readers, and for all the adverse and vindictive criticism directed against Mr. Schumacher's statements we firmly believe that the majority of the Rand's employees—the more thoughtful and intelligent of them at any rate—are grateful to him for the frank enunciation of his views. But whilst it is indisputable that the controlling Houses are most earnest in their endeavours to bring about improvement, it must be admitted that there is still plenty of room—enormous room, in fact—for bettering methods of managing men, and we must confess that there is some truth in the statement of Mr. Motherwell: "When anything goes wrong the usual remedy is to sack somebody, although the fault may lie in the 'system.' One has therefore to do his work not in the correct way, but in such a way as not to get the sack."

Mr. Motherwell proceeds to quote from Mr. Alfred James' "Annual Review of Cyaniding Progress" for 1911, in which Mr. James vigorously champions the filter press. The observer from the Antipodes then writes: "Until quite recently all the mines used the decantation process of treating slimes, which has been discarded everywhere else. During the last two years about a dozen vacuum filter plants have been, or are being, erected, mostly on mines belonging to the Rand Mines, Limited, group." We should be the last to in any way decry the wholly excellent work done by filter presses, both in this country and in other parts of the world. At the same time decantation is certainly not to be subjected to the opprobrium that Mr. Motherwell seems to accord it—not continuous decantation at any rate. We recently referred to the very thoughtful consideration given to the relative merits and demerits of vacuum filter presses and continuous decantation by certain leading metallurgists in America, and we then stated that many were in favour of continuous decantation. We would direct attention to a letter received from an American correspondent on the subject, which we recently received and which has an interesting and well-informed bearing on the matter. Our correspondent writes:—"I note from reading your paper that the filter question in South Africa seems to be very acute, and I cannot help believing that it will cause the average metallurgical man to start thinking of some other method of recovering his dissolved values. Over this side the filter litigation has, no doubt, helped us quite a bit in regard to continuous decantation, and I should imagine the same will happen over your side of the water. At the time I wrote you last, I note I said that we had 9 continuous decantation plants operating, but I might mention that to-day there are about 15 or 16, with some 5 or 6 others either being built or being changed around to operate along these lines. Referring to the new Dorr agitator, our correspondent writes: "This is certainly coming to the front rapidly, and we find that it is appealing very strongly to metallurgical men and engineers. The horse power required to operate the machine is showing up wonderfully low. The 20 x 10 agitator that is going out, should leave this country about the last week of this month, and I am sure it will be of considerable interest to everybody on the Rand." In concluding the first portion of his article Mr. Motherwell writes in a paragraph appearing under the sarcastic heading of "The Daring Originality of Rand Metallurgists." "They copied the idea of separate rooms for amalgamating plates from Waihi (N.Z.), vacuum filters from America and New Zealand, filter presses from Australia, Pachuca tanks from New Zealand and Mexico, tube mills from Australia, Merrill filter presses for zinc dust precipitation from America, Blaisdell distributors and excavators from America, conveyor belts for transferring rock and sand from America and Australia, and so on. Few, if any, of these ideas were introduced to the Rand by Englishmen, but by Australians, such as the Denny Bros., and Americans, such as F. L. Bosqui. The 'South African Mining Journal' drew attention to this 'regrettable fact' in April, 1912. Ralph Stokes, who is a Rand man, and the author of 'Mines of the British Empire,' admits that metallurgically the Rand is behind Kalgoorlie."

We, ourselves, have certainly drawn attention to this, although we cannot find that we used the word "regrettable." As to Mr. Stokes' admission, we would inquire when he made that statement and whether he would not to-day waive it. The comparative simplicity of Rand banket ore has, no doubt, conduced largely towards restriction of inventive tendencies, but the Main Reef mines have gleaned all that is best from other fields, and the modern composite Rand plant is certainly to-day as efficient as the best that any other gold field on earth can point to. We shall await a further instalment of Mr. Motherwell's views with interest.

Witwatersrand Township, Estate and Finance Corporation.

Dividend No. 16 (interim) of 5 per cent. (1s. per share) on the capital of this Corporation has been declared, payable to all shareholders registered as such on June 30.

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TRANSVAAL CHAMBER OF MINES' REPORT.

Industrial Questions Reviewed.

The report of the Executive Committee of the Chamber of Mines, issued this week, has the following, *inter alia*:—

Natives Employed in Labour Districts of Transvaal.—The monthly report issued by the Department of Native Affairs shows that at the 30th April, 1913, 332,252 natives were employed in labour districts of the Transvaal. Of this number, 243,597 were engaged on mines and on the various classes of works, *i.e.*, chemical, metallurgical, brickmaking and other works as defined in Part I. of the Coloured Labourers' Health Regulations, 1906, and 88,655 were in other employ.

Tropical Natives.—In reply to a question on this subject, the Minister of Native Affairs announced in the House on May 8th that the Government had decided to prohibit further recruiting in all areas North of Latitude 22° South for work on the Witwatersrand Gold Mines.

Select Committee on Native Affairs.—The First Report of the above Committee has been issued, which deals with the agreement between the Portuguese Government and the Witwatersrand Native Labour Association, dated December 4th, 1912. The report states: (1) That there is no objection to the principle of deferred pay, and (2) that no alteration be made in the initial period of service provided for in the Convention, at any rate until the Report of the Tuberculosis Commission is received. It further recommends that the recruiting of natives in the Province of Angola should not be sanctioned by the Union Government.

Immigrants Restriction Bill.—The new draft of the above Bill was published in the *Government Gazette Extraordinary* of the 3rd April. It differs considerably from the Bill that was before Parliament last session. In December, 1912, the Chamber made representations to the Government on two points: (1) To provide that natives from the existing sources of supply outside the Union should have the right of entry without being required to pass the dictation test laid down in the Bill: and (2) to provide that natives permitted to enter the Union, and those residing therein, should have the right to move freely from Province to Province without being required to pass any such test. Amendments embodying the Chamber's recommendations are contained in the above draft. At the end of May the Bill had passed the House of Assembly, and as the result of amendment natives domiciled north of latitude 22 degrees south of the Equator are not exempted under the Bill from the dictation test.

Select Committee on European Lobour.—The Select Committee which was appointed to enquire into and report on "European Employment and Labour Conditions" issued its report in May. As regards the mining industry, the Committee recommends that "while hesitating, for the reasons stated, to recommend the mines as a field for the employment of unskilled labour underground," it urges the extension of the apprenticeship system.

Mines and Works Act, 1911.—The proposed additions and amendments to the Regulations under the above Act were considered by Committees of the Chamber, the Committee of Consulting Engineers, the Association of Mine Managers, and the South African Institution of Engineers. The Chamber has submitted a memorandum to the Government, embodying its views on the proposed amendments. No amended Regulations have as yet been promulgated.

Mining Taxation Act, 1910.—In May the Chamber addressed the Government on the subject of the amortisation of capital expenditure under the above Act, with special reference to the apportionment of such expenditure between the pre-taxation and post-taxation periods. The request was made that companies might continue to avail themselves of the latest apportionment of capital expenditure arrived at under a working agreement framed under the 1902 Profits Tax Proclamation for the purpose of calculating the amortisation allowances under the present Act, if they so desired. A reply had not been received from the Government at the close of the period under review.

Transvaal Precious and Base Metals Act Amendment Bill, 1913.—This Bill was published in the *Government Gazette Extraordinary* of the 16th April. It contains provisions relating to the trading by natives and coloured persons in locations on proclaimed land, and further contains important amendments modifying the definition of unwrought precious metal as at present defined in the Precious and Base Metals Act No. 35 of 1908 (Transvaal). It takes power to make regulations for the licensing of persons dealing in unwrought precious metal, the control of businesses so licensed, the hall-marking of articles manufactured in the Union from precious metals, and the better prevention of unlawful dealing in unwrought precious metal. The Bill had not been passed by the House of Assembly at the end of May.

Bewaarplaats Moneys Application Bill, 1913.—This Bill was published in the *Government Gazette Extraordinary* of the 4th June, and provides that the registered owner of the land upon which the bewaarplaats is situate is to be paid one-half of the moneys received by the Crown in respect of any lease or other contract disposing of the right to mine underneath any such bewaarplaats. This principle is in accordance with the Report of the Bewaarplaatsen Commission of 1909. The provisions of the Bill have been considered by your Executive Committee, and certain recommendations have been submitted to the Government.

Ocean Freight on Bullion.—The terms of the agreement embodying the proposed reduction in the present freight rate on raw gold have now been agreed upon by all parties, including the Banks, and it is expected that the agreement will shortly be ready for signature.

MINING MEN AND MATTERS.

His many friends will be glad to hear that Mr. W. H. Haig has taken over the management of Messrs. Fraser & Chalmers, Ltd., of the Corner House, in place of Mr. C. E. Rogers, who is remaining with the firm in London.

* * * *

Mr. F. Percy Rolfe, who has been appointed manager of the Peach Tree Syndicate, Ltd., has left Johannesburg for Pilgrims Rest.

* * * *

The first annual general meeting of the S.A. Association of Analytical Chemists will be held in the S.A. School of Mines, Johannesburg, on Monday, 23rd June, at 8.15 p.m., when Dr. J. McCrae will deliver his presidential address. All interested are invited to be present.

* * * *

The South African Diamond Corporation having taken an interest in National Diamonds, has nominated to the board of the latter company Messrs. G. Hesse and H. Daniels.

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

Premier Diamonds.

The directors of the Premier (Transvaal) Diamond Mining Company, Ltd., notify the declaration of a dividend (No. 10) of 400 per cent. 10s. per share) on the deferred shares, payable to shareholders registreed on June 30. The dividend will be paid as soon as the necessary returns have been received from the London office. The amount to be distributed is £160,000.

South African Mining Journal

REMOVAL OF OFFICES.

The Offices of the South African Mining Journal are now situated at Nos. 176 to 180, STOCK EXCHANGE BUILDINGS, Fox Street, Johannesburg—(2nd Floor).

AFRICAN FARMS' INTERESTS.

Valuable Mining Holdings—One and a Half Million Acres of Land—Strong Cash Position.

Mr. Julius Jeppe presided at the African Farms' annual meeting this week, and concluded his lengthy review of the assets of the company as follows:

Turning to our mining ventures, I intend to allude only to those which, due to further development and work during the year under review, have merited special attention and which are under our own immediate control, and will not specifically refer to other producing concerns in which we have shareholding, such as the Pretoria Cement, Witbank Colliery, Bantjes Consolidated Mines, and which are regular dividend-payers, nor to the Fairview (T.C.L.), Ltd., and the McCreedy Tins (Swaziland), in each of which we hold about 20 per cent., and which will enter the dividend paying stage within a month or so. *Rietvallei.*—In March last I reported to you that we had let the mine, on which 30,000 tons, giving 5 dwts. (gold) pan value, had been developed, to the Rietvallei G.M. Co. on a royalty basis. Owing to lack of funds, this company has been unable to carry out its obligations, and the 10-stamp battery which they transported to the mine has not yet been erected; but a mynpacht of 281 morgen and water-rights sufficiently strong to generate all the power required for milling have been secured during the year, and a certain amount of additional development has been done by that company; your directors are now having a thorough investigation made, after which they will decide upon a definite policy. With regard to the York mine, I stated at the last general meeting that before the end of the year now under review we would have received by way of dividends the entire amount of £24,666 we originally invested, snd, although the life of the mine is drawing to a close, we are assured of additional considerable sums by way of dividends. I would here like to record our grateful appreciation of the splendid work done by Mr. William Elliott, the capable manager of the mine. With reference to your freehold farm Welgevonden, to which I referred a few minutes ago and alluded to at the special general meeting of November 19th, I am glad to be able to tell you that the 10-stamp mill and the reduction works are now nearing completion, and crushing will commence in July or August. Mr. E. B. Day, our manager there, assisted by Mr. J. G. Jorgensen, the construction engineer, has, under the supervision of Mr. J. Irvine Jameson, the consulting engineer, worked zealously and efficiently in the development of the mine and the erection of the plant. Had it not been for an unfortunate defect in the crank-shaft of the engine, discovered before it was shipped by the makers, we would have been milling before the end of this month; when we start, the mine will be at least nineteen months ahead of the mill. Mr. Jameson has furnished us with a report up to May 31, which states that the total tonnage of milling ore developed and grassed at that date from the four chief sections of our property—namely, the No. 8 area saddleback, Argil lode, and south-west workings—amounts to 20,226 short tons of a grade of 2.7 per cent. metallic tin; he further states that it is possible that this tonnage will be exceeded when stoping actually takes place, owing to supplementary fillings on bedding planes. He goes on to say that he has included no tonnage from the outside prospects, such as the far east workings, Pack lode and No. 1 area, all of which are of considerable promise; further on, dealing with the construction work, he says: "I think it would be generally admitted that you possess a small, efficient, modern plant, which has been erected on sound lines for economic working at a particularly low cost; the plant should be successful and give satisfaction." Your company is the entire owner of the farm and mine. And now we come to Leeuwpoort. In view of our large shareholding in this company—namely, £115,088 out of an issued capital of £275,000—and in view of the fact that this company is administered by the African Farms, Ltd., your directors have decided to attach to the report of to-day's meeting the directors' report and balance sheet of the Leeuwpoort (African Farms) Tin Mines Company, as well as the full account of its annual meeting held on the 13th inst. Shortly, its position is as follows: It owns the freehold of 2,579 morgen of the farm Leeuwpoort and an option to purchase the remaining 1,385 morgen, and the mineral rights over 1,099 morgen of the farm Rietfontein, adjoining Leeuwpoort. On the property seven distinct mines have so far been located and developed, the greatest depth reached in any of them being 652 feet on the incline, where a well-defined lode gave values of 13.1 per cent. metallic tin over 7½ inches, and where for the last 100 feet an average value of 6 per cent. over 15 inches had been obtained. Among the other mines, the "H.G." may be referred to; on this 26,000 tons of an average value of 3 per cent. had been developed up to May 31 last. The total tonnage of ore at grass and developed ore reserves amounted to 120,087, valued at 2.29 per cent. metallic tin; the value of the ore developed during the period December 31 to May 31 last was 2.92 per cent. The mill, designed to treat 4,500 tons a month, will start crushing in August. In addition to the different lodes already proved on your property, we have a deposit of alluvial tin estimated at 2½ million cubic yards, with an average value of 2s. 2d. per cubic yard (if we take to-day's price, namely, £208 per long ton); the total value of this, therefore, is only £5,000 short of the entire capital of the company. I do not think it necessary, however, to go into further details, since, as I said before, all the reports, etc., of the Leeuwpoort Company will be attached to the documents to be issued to our own shareholders, who will be well repaid for any time they may spend on a very careful perusal of them.

POSITION SUMMARISED.

Now, in conclusion, might I be allowed to summarise the position of our company? We have, to begin with, shares to the value of £328,000; a considerable portion of these are already paying good dividends, and others, such as the Leeuwpoort Tins, Fairview and McCreedy, will yield additional dividends during the current year. We have in our Welgevonden Tin Mine another sure dividend-producer. We have over £98,000 in liquid assets, by way of bonds, loans and bills receivable. We are assured of a good return on the £22,000 odd invested in livestock and improvements on farms. We can look forward to good income from our diamond interests, and, in addition to it all, we have over a million and a half acres of land spread over entire South Africa, the possibilities of which no man can gauge or estimate; surely, gentlemen, you will agree with me when I say that a prosperous future is awaiting us. Before resuming my seat, I would like to express the Board's appreciation of the loyal and efficient services rendered by the whole staff during the year. I now beg to move that the directors' report and accounts for the year ended December 31, 1912, be adopted.

It is rumoured that the Government has under consideration a proposal for the establishment of a special Mines Sanitation Department for the whole of the Reef. The suggestion is that the new service should be directly under the control of the Minister of Mines, and entirely independent of the municipal health authorities. The name of Dr. Gregory, formerly Medical Officer of Health for Cape Colony, is mentioned in connection with the post of Medical Superintendent of the proposed department. Since his retirement, on pension, from the public service, consequent on the reorganisation of the Public Health Departments within the Union, Dr. Gregory has been serving as Chairman of the Tuberculosis Commission.

POSITION AND PROSPECTS OF WIT. T. E. & F. CO., LTD.

Prosperous Concern with a Big Future—Mr. Jeppe Reviews the Year.

SPEAKING at the annual meeting of the Witwatersrand Township, Estate and Finance Corporation, Ltd., this week, Mr. Julius Jeppe, the chairman, said, *inter alia*:—

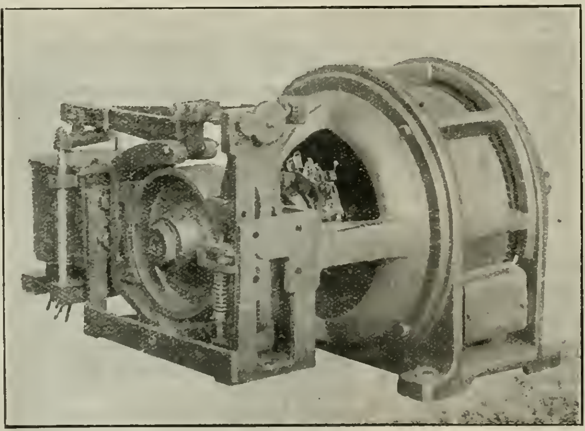
"Turning to our assets, we find that the sale of some of the freeholds of your stands has reduced the item property account by £1,073. The other items on our list of assets, such as houses, unsold stands, investments in property, show no material variation from the previous year's figures. You will notice, however, that we have made the usual provision for depreciation by writing off adequate sums from both the 'houses' and 'property investment' accounts. The amount we have invested in shares—namely, £97,660—is nearly £7,000 more than we had in 1911, due to the purchase during the year of shares in land-owning companies, which promise profitable returns. Otherwise our holding has not been materially altered, and you will observe with pleasure that we had only to write off a sum of £273 to bring those shares which were standing above market value at the end of the year down to such market value. We have, however, not taken into account any appreciation on other shares which took place during the year under review: as a matter of fact, the real total value of your holding is considerably above that at which it figures in our books; for instance, your large holding in the Pretoria Townships, Limited, has been considerably enhanced during the year. This company's suburb Waterkloof has firmly established its name as a most fashionable and salubrious suburb, and although the Union Capital has not progressed quite as quickly as we anticipated, there can be no doubt as to its future prosperity, by which the Pretoria Townships, Limited, will materially benefit. A list of your shareholdings is again placed upon the table for your information, and a copy of it will be sent to London for the benefit of shareholders there. The account sundry debtors shows a reduction of about £1,600, which needs no explanation, neither does the item office furniture. Bonds and loans, at £72,046 (I am leaving our shillings and pence in this review) has been increased by about £6,000. After very careful scrutiny of the securities held to cover these bonds and advances, there seemed no reason for making any provision for writing off depreciation this year, the whole amount being adequately secured. We have again redeemed £1,000 on account of life governor's fees, and will during the current year finally wipe this off our accounts by the redemption of the last £750.

PROFIT AND LOSS.

Coming now to our profit and loss account, you will note the total charges during the year under review have been £16,178—a reduction of about £500, although rates and taxes have been somewhat heavier than the previous year. Against this revenue from all sources, £36,225, shows a decrease of £534. As a matter of fact, our ordinary current revenue in 1912 has been about £850 more than the previous year, but we received in 1911 an amount of £1,385 on a special sale of freehold in one of our townships, which accounts for the difference in the total revenue. The appropriation account does not require further explanation. As I have already said, the amount standing to its credit—namely, £146,967—is kept as a reserve, and has been and will be utilised for equalising dividends. There is one pleasing feature in this account, however, that I may allude to, and that is the inclusion of an amount of £738 which has been written off in previous years as bad and doubtful, but which has since been secured; finally, this account shows that dividend No. 15 of £20,000 was declared on October 15, and was paid when the transfer books of the head office had been adjusted with those of the London transfer office. Well, gentlemen, I do not know that I have much more to add to my review of the account. We have had what one can consider under all circumstances a fairly satisfactory year. It is true we have made no extraordinary profits, nor have we disposed of any considerable portion of our large land holding, but we have undoubtedly strengthened the position of our company, which must to-day be considered very sound and safe. Our different townships, in spite of keen competition, continue to increase in popularity, and so do those in which we are largely interested. It is unfortunately true that the hope I held out last year with regard to Malvern has not been realised; I am, however, pleased to state that the other large shareholders now appear to be more in agreement with our view, and we have therefore every reason to hope that before we meet again the outstanding difficulties will be surmounted, and this particular company, in which you hold over half the entire capital, will become a dividend producer.

LEASEHOLD TOWNSHIPS COMMISSION.

You will remember that when I addressed you at the last ordinary general meeting, I went into full details with regard to the Leasehold Townships Commission. At that time the report had not been published; it was, however, issued shortly afterwards, and its contents and suggestions might have exercised the minds of those who are connected with township companies were it not for its unreasonable and one-sided recommendations. They are so unjust and impracticable that no fair-minded man or Government can act upon them. In conclusion, I am glad to be able to tell you that the directors have just declared an interim dividend of five per cent., payable to shareholders registered on June 30.



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MINE SAMPLING AND ORE VALUATION, WITH SPECIAL REFERENCE TO THE WITWATERSRAND AREA.—VIII.

[By Arthur S. Lejeune.]

Chapter 7.—Faulting.

Geologists divide the earth into two spheres, viz., the lithosphere and centrosphere. Of the centrosphere, which comprises the interior and greater part of the earth, we know nothing and can only conjecture; but of the lithosphere, which is composed of rocks, the study of which is the special province of the geologist, a good deal is known, much of which is invaluable in mine exploitation. The atmosphere encircles the lithosphere and with it we are well acquainted. The eminent geologist, Van Hise, divides the lithosphere into three zones, viz., the zone of fracture, the zone of flowage, and the zone of fracture and flowage. The zone of fracture is near the surface, and is the zone which directly concerns the miner. The characteristics of this zone are deformity of the rocks, faulting, jointing, fissility and brecciation due to the earth's cooling and to dynamic forces. It is intended to deal in the present chapter exclusively with the characteristic faulting.

Faulting is of two kinds—normal and reverse. Faulting is said to be normal—it is also described as simple and tension faulting—when the strata on one side slides down the fracture plane. Fracture usually occurs at an angle of 45°, and is caused by the rocks being stretched in excess of their elastic limit. Fig. I. shows a normal fault:—

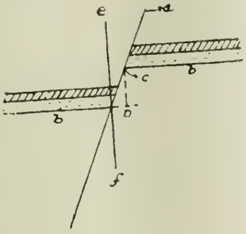


Fig I

a fault plane, b b faulted strata, c d the extent of throw occasioned by fault.

The line c d must be measured at right angles to the dip of the strata. Reverse faulting—also known as compression and overlap faulting—occurs when tangential thrust is the predominating force. In Fig. 2 compression has forced the strata to assume loop form, and Fig. 3 shows the same strata after fracture has taken place. The strata are shown forced along the fracture plane resulting in overlapping:—

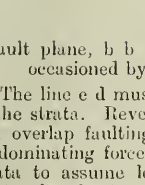


Fig II

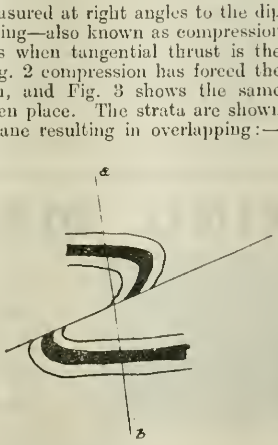
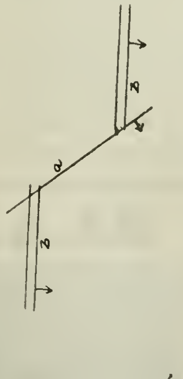


Fig III

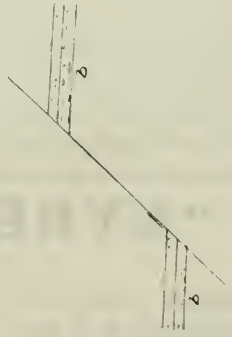
Both normal and reverse faults may be strike, dip, or oblique faults. The strike of a fault is its horizontal direction, and its dip the direction it takes into the lithosphere. When the horizontal direction of a fault is parallel with the strike of the ore deposit, it is said to be a normal or reverse strike fault, as the case may be, and a dip fault when it strikes more or less at right angles to the strike of the deposit. The term oblique is seldom used in mining. It is occasionally applied to faults striking midway between the strike and dip of the deposit. To determine whether a fault is normal or reverse, Sir Archibald Geikie's method is perhaps the simplest to apply and the easiest to remember. He says a fault is normal when a straight line drawn at right angles to the strike of the deposit cuts the deposit only once. See e f, Fig. 1, and a reverse fault if a straight line drawn at right angles to the deposit cuts the same deposit twice, Fig. 3, a b.

Prominent among the phenomena of the Witwatersrand we find that nearly all dip faults are normal, and that the majority of strike faults are reverse, and on some mines the strike of the fault is regarded as the deciding factor in solving a dislocation. The rule—if rule it can be called—cannot be regarded as absolute, for exceptions to it are met with. On mines where tunnelling is carried out on a shale or schist footwall, faulted reef is usually easy to locate. If the miner passes through a fault into shale he knows the reef is above him, and he crosscuts in the direction of the dip until he intersects the lost reef. If he passes into quartzite he knows the reef is below him and he crosscuts in the opposite direction. When, however, the reef rests on a quartzite footwall, and has a similar hanging wall, and it gets suddenly cut off by a fault, the locating of the lost strata presents a problem very difficult of solution. Some maintain the theory of the greater angle, as advanced by Zimmerman, is equally applicable in the case of reverse as in that of simple faults. Zimmerman's rule: "Strike the fault with your feet first; go up to find lost deposit; strike it with your head first, go down," invariably holds good in the case of normal faults. But in the case of reverse faults a careful examination of the footwall and hanging wall quartzites and of the quartzites beyond the fault is usually safer data to work on than that of strike and dip.

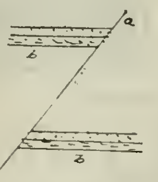
The following cases are examples of normal and reverse faults in plan and section. In every case "a" represents the fault plane, and "b b" the strata affected. In the case of the "plans," the small arrows indicate the directions of dip.



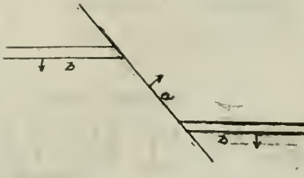
PLAN (NORMAL)



SEC-ON (NORMAL)



SECTION (REVERSE)



PLAN (REVERSE)

PROGRESS OF WELGEVONDEN TIN MINES.

Modern, Efficient Plant Erected at Small Cost.

THE Consulting Engineer's report for the year ended 31st December, 1912, on Welgevonden Tin Mine, belonging to African Farms, Ltd., states:—

It will be noticed that the larger portion of the 4,304 feet of the development work has been carried out on the "Argil" lode. Owing to temporarily indifferent results at the original No. 8 Section, it was resolved (in April, 1912) to exploit a fissure which was located in No. 2 Adit. This new lode is only partially developed at present; the results to date have been very satisfactory—a large tonnage of high-grade ore has been obtained from the development face on the west drive (adit level) and dumped at the mouth of the adit. The development work at present being carried out is limited to making the connection on the adit level between the West Drive Argil Lode and the No. 8 Shaft, and a limited amount of exploration work at the recently discovered south-west workings. As soon as milling is started, it will be necessary to push on with further development work, which has been unfortunately unavoidably stopped owing to financial considerations. *Ore Reserves.*—The estimated total milling tonnage at the 31st December, 1912, is 19,200 (short tons), of an average percentage grade of 2.55 per cent. met. tin. Assuming that with the battery of ten stamps at present being erected, a monthly milled tonnage of 1,200 is maintained, the estimated reserves will provide for sixteen months' milling. It is only reasonable to suppose that during this milling period further development will disclose additional milling tonnage in the future. *Surface Works: Milling and Concentrating Plant and Power Plant.*—The milling and concentrating plant consists essentially of:—1 jaw crusher, 10 stamps (1,250lbs. falling weight), with Challenge feeders, 4 Wilfley tables, 1 small tube mill, 5 Isbell Frue vanners (6ft.), 2 Cornish round frames, 1 Acme Revolving table, 2 buddles, with the necessary dewaterers (callow tanks), classifiers, and dipper wheel. This plant will be capable of treating a minimum of about forty short tons per diem with the proposed battery mesh screening to be employed. The site for the mill was finally selected with a view to economy in working, and to allow for possible extension at small cost in the future. The ore from the mine and surface dumps is trammed to the adit mouth, where it is dumped into a collecting hopper. For this point it is automatically conveyed to the crusher on a conveyor belt. From the crusher, the fines are conveyed on a fines conveyor belt direct to the battery bin. Provision has been made for sorting the ore, if feasible, on the coarse conveyor belt in transit from the collecting hopper to the crusher. *Power Plant.*—This consists of two suction gas engines—(1) Tangye "hit and miss" type of 33 b.h.p. at Welgevonden altitude (Weynek old engine), which will drive the stamps and supply power for electric lighting, and subsequently the magnetic separator (wet method); (2) a new Campbell four-cylinder Vertical Gas Engine of the latest type, direct coupled to a three-phase 550 volts Siemens' Alternator (60 k.w.), 85 b.h.p., continuous running at Welgevonden altitude (4,700 ft.). This prime mover will generate current to motor-drive the Wilfley tables, frue vanners, dipper wheel, round frames, Acme table, crusher, tube mill, fine and coarse conveyor belts, mill supply fresh water pump, and return water centrifugal pump. One motor only drives both conveyor belts and the crusher. Provision has been made to do all the necessary sorting and crushing for the 24 hours' milling on day shift only. A similar provision allows all the water required for 24 hours' milling to be pumped in twelve hours. An adequate size return water pump has been installed at the slimes dam to ensure that all return water will be returned, and to provide for the necessary quantity in circulation. The fresh water mill supply is drawn from the Klein Sterk River (5,500ft. distant), where a pumping station is being erected, the power being transmitted by overhead lines. Fresh water and return water tanks of sufficient capacity, constructed of concrete, partly embedded in the ground, are being provided for shortage of water. The entire plant mentioned above has had to be erected on rigidly economical lines. The purchase of the second-hand Weynek plant at a nominal price has made it possible to erect a modern, efficient plant at small cost. It is estimated that the entire cost of the plant and erection will be paid for out of profits within eight months after milling has started, assuming that the present price of Straits tin is maintained. The construction work is well in hand, and unless any unforeseen delay takes place in the delivery of the machinery ordered, milling should start in June next. It will probably be necessary to add further units of slimes plant, *e.g.*, rag frames, after milling has been started and the behaviour of the ore under treatment has been gauged. Also the erection of a calciner drying shed and magnetic separator (which formed part of the Weynek purchase) have been left in abeyance for present economical reasons. *Conclusion.*—The chief result of the years development work has been to make the erection of a suitable plant possible, owing to the satisfactory increase in the ore reserves. The prospects of obtaining further payable tonnages, as soon as development work is restarted on a larger scale, are certainly most promising. The mine must be regarded as a small one at present, but with careful management should make satisfactory profits on the capital expended, as the "lay out" of the mine and plant will make for cheap handling of the ore, and consequently comparatively low working costs.

The Mine Manager's report for the year ended 31st December, 1912, states, *inter alia*:—

Prospecting and Development.—The footage sunk, driven, and risen for the year totalled 4,304 feet, irrespective of 4,574 feet of prospecting cutting. The principal amount of this work was carried out on the "Argil Lode," located in the No. 2 Adit in April, 1912. Considerable prospecting operations were also carried out on the "Pack Lode," west of the mynpacht, and also on what are known as the "Far East Workings." Both these two latter workings gave fair prospects, but owing to shortage of native labour, and economical reasons, it was decided to abandon operations on the Pack Lode and Far East Workings for the present, and to concentrate the labour on the Argil Lode workings. In the last fortnight of December, another rich chute of tin-bearing ore was located on the hill to the south-west of the No. 8 (Main) Shaft. This has been named the "South-west Workings," and already a considerable quantity of very rich ore has been extracted. On account of the recent curtailment of development work on the mine, it was only possible to spare a few boys to carry on the work on this new strike, and at present it is impossible to say what it may develop into. The average cost of all prospecting and development work for the year 1912 was £1 9s. 1d. per foot. This figure has been worked out on the basis of the 4,304 feet sunk, driven and risen, and exclusive of the 4,574 feet of prospecting trenches, which, however, are included in the total cost. *Ore Reserves.*—The total tonnage of milling ore exposed, developed, and at grass at the 31st December, 1912, at the three chief sections, viz., "No. 8 Area," "Saddle Back," and "Argil Lode" is as follows:—(1) Total ore at grass, 4,540 short tons; 3.39 per cent. met. tin; value £24,731; (2) total ore exposed-developed, 14,660 short tons, 2.29 per cent. met. tin; value £54,043; total, 19,200 short tons; 2.55 per cent. met. tin; value £78,774. The gross value shown is based on met. tin at £180 per long ton. With Straits tin at its present price, say £200 per long ton, the gross value is £96,280. The net value, assuming an extraction of 75 per cent. on milling, is £72,210.

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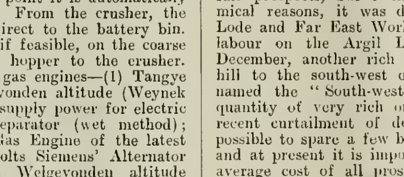

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THE YEAR WITH RAND MINES, LIMITED.

Mr. Schumacher's Review—Increased Profits—French Shareholders' Views.

THE annual meeting of shareholders of Rand Mines, Ltd., was held on Wednesday. Mr. R. W. Schumacher presided, and there were also present Messrs. E. Callens, G. Sonn, H. A. Rogers, H. Eckstein, E. J. Renaud, J. L. Jourdan, E. Chappell, C. Meintjes, H. C. Boyd, A. G. Gill, M. Francke, representing 539,447 shares out of a total issue of 2,125,995. The Chairman said, *inter alia*: The reports for the year 1912 have been in your hands for a long time, and the annual meetings of the various companies in which we are interested have been held quite recently. Full statements have been made in each case by the respective chairmen, so I propose to confine myself to a comparatively brief review. The unusual strength of the gold mining companies in which we are largely interested, and which we help to control, can be shown at a glance by the following figures dealing with their ore reserves per 31st of December, 1912:—

Company.	Ore Reserves excluding shaft and safety pillars. Tons.	Value in shillings.	Value of Contents.
Modder B.	2,594,000	30.2	£3,917,000
*New Modder	3,900,000	34.0	6,630,000
Rose Deep	3,462.800	25.3	4,380,000
Geldenhuis Deep	1,588,400	26.3	2,089,000
§Nourse Mines	1,839,900	27.6	2,539,000
City Deep	1,914,540	36.4	3,484,000
Village Deep	1,922,400	29.4	2,826,000
Village Main Reef	1,683,066	33.6	2,828,000
Crown Mines	10,048,701	29.4	14,772,000
†Ferreira Deep	1,649,177	40.0	3,298,000
Bantjes Consolidated	733,300	28.6	1,049,000
Durban Rood. Deep	965,300	28.2	1,361,000
	32,301,587		£49,173,000

* Ore reserves at 30th June, 1912.
§ Ore reserves at 31st July, 1912.
† Ore reserves at 30th September, 1912.

These ore reserves, totalling 32,301,587 tons, contain gold to the estimated value of £49,173,000, exclusive of the gold to the value of £4,393,000 in safety and boundary pillars which will also eventually be recovered. Apart from its finances and from current working profits, no surer view of a mining company's prospects can be obtained than by examining the state of its ore reserves, the value of developments in the lowest levels and, of course, the size of the property.

COMPANY PROFITS.

I need not dwell on the financial position of our working companies, as they are all dividend payers, and only one, the Crown Mines, Limited, has a debenture debt. The working profits of these mines in 1912 were as follows:—

Crown Mines, Ltd.	£1,314,217
Modderfontein B G.M., Ltd.	382.153
New Modder G.M., Ltd.	540,280
Rose Deep, Ltd.	146,823
Geldenhuis Deep, Ltd.	134,853
Nourse Mines, Ltd.	269,868
City Deep, Ltd.	282,419
Village Main Reef G.M., Ltd.	192,415
Village Deep, Ltd.	294,810
Ferreira Deep, Ltd.	589,209
Bantjes Consolidated Mines, Ltd.	77,746
Durban Roodepoort Deep, Ltd.	82,085
Total	£4,906,708

GENERAL MINING POLICY.

I now turn, in passing our companies in review, to the other important points which I have mentioned. Our general mining policy has for years been to strengthen the ore reserves of our companies and to increase the number of stope faces in such a way that the mines can work at ease, and not under pressure or from hand-to-mouth, and this policy is now in many respects completed. The Crown Mines, Limited, is the biggest and best example with its 10,048,700 tons worth 29s. 4d. per ton, containing gold to the total value of £14,772,000, and a working profit in sight of approximately £6,230,000, taking working costs at 17s. per ton, the average of the first five months of this year. In the natural course of events we expect the working costs at most of our mines will decrease, so that the profit in sight is in nearly all cases greater than is indicated on the basis of the working costs of to-day.

TURFFONTEIN ESTATES.

I must inform you that during the present year we have strengthened our interest in the Turffontein Estates, in which we now hold 19,520 shares out of an issued capital of 50,000 £1 shares. You will remember that I told you last year that the whole of the deep level ground on Booysens and South Deeps which lies to the south of the Robinson Deep and the Grahamstown dyke, as well as the whole of the mining area to be obtained on Turffontein in the form of mynpachts and otherwise, is, by arrangement, to come under the control of the Rand Mines, Limited, and The Central Mining and Investment Corporation, Limited. In other words, we and the Village Deep control the whole of the extensive deep level area in the central and perhaps the richest portion of the Rand situated between the Crown Mines on the west and the City Deep on the east. In the case of most of our mines the period of large construction programmes and of heavy capital expenditure is passed, and all energy can now be concentrated on working the mines to the best advantage.

UNDERGROUND COSTS.

As far as underground costs are concerned, we are continuing to effect improvements on the lines that I indicated in my previous addresses to you, and there can be no doubt that working costs will gradually be reduced. Our efforts continue to be concentrated on mining to the best advantage in order to earn the maximum profit while working the mines fairly. We have, I know, been accused in some cases of resorting to selective mining. The phrase "selective mining" has been used by various critics somewhat vaguely, and as if selective mining were necessarily wrong. I can only plead that if selective mining means working the payable ore of a mine and avoiding, as far as possible, the unpayable ore, then we have indeed been guilty of mining selectively at all our properties. We take pride in working our mines with the utmost care and of aiming primarily for profits. It has been urged by some critics that our selective mining has meant overworking certain mines, and specific charges have been brought in regard to two companies, the New Modderfontein and the City Deep, of both of which I happen to be chairman. My reply is that the ore reserves of the New Modderfontein, which stood at 3,341,830 tons, worth 7.6 dwts., at the 30th June, 1911, were raised to 3,900,000 tons, worth 8 dwts., at the 30th June, 1912. Again, at the City Deep the ore reserves which at the end of 1911 amounted to 1,912,000 tons, worth 8.1 dwts., stood at the end of 1912 at the enhanced value of 8.7 dwts. for 1,914,540 tons. I think it will be admitted that these are effective answers to the charges that have been made. It is true that at another mine, the Modder B., we have been openly and admittedly working above the estimated value of the ore reserves. There have, however, been excellent reasons for this. In the first place, one of the very largest blocks of ore in the mine, containing about 300,000 tons, and consisting of low grade but payable ore, could be attacked only from the western face, as the eastern face became temporarily unpayable. In other words, we were unable to mine a due proportion of rock from this low grade block. It is the intention to sink a winze through the centre of this block, which can then be attacked from three faces altogether. We have found also in practice that by careful mining it has been possible in some places to leave intact certain areas of unpayable ground situated in payable blocks. In this way the grade the ore mined has been kept above the level of the estimated values of the ore reserves. I might add also that in the case of some of the large blocks, I refer especially to the richer ones, it was originally thought desirable to keep the estimates of value conservative. From what I have said I think it will be clear that the mining policy of the Modder B. has been entirely sound.

SANDFILLING.

Sandfilling operations were continued during 1912 at a number of our properties, notably the Crown Mines (249,000 tons), Ferreira Deep (202,000 tons), Geldenhuis Deep (150,500 tons), Rose Deep (57,000 tons). Up to the end of the first quarter of this year, 2,000,000 tons have been filled in the workings of various properties under our control, the Ferreira Deep, which has for some little time stopped filling, standing first with the largest amount of 773,600 tons, the Crown Mines being second with 476,300 tons. Every effort is made in other directions to keep the mine workings everywhere as safe as possible. The present safe state of the Ferreira Deep mine and its excellent prospects for the near future are due in a very great measure to the thorough manner in which sandfilling has taken place in the upper levels of the mine. Numberless difficulties have been removed—we hope permanently—which were previously constantly hampering mining operations and causing great difficulty and expense at that property.

VENTILATION.

We are continuing to pay special attention everywhere to proper ventilation and to improving the health conditions underground. We are determined to do everything not merely to check phthisis, but to stamp it out, if possible, and we are sparing no expense where health and life are concerned. The free use of water for spraying operations underground, the saturation of air after blasting and also throughout the day in the main air channels, control of blasting operations, single-shift system, and the removal of the majority of workers before blasting—these and other methods are either in practice now or, as in the case of the single-shift system, are being striven after. The new circular shaft that is being sunk at the western extremity of the Crown Mines will enable development in that section of the property to be pushed with greater speed, and also under better health conditions. The circular ventilating shaft that has also just been started at the City Deep will put the ventilation of this mine right for the whole of its life. By the steps that are now being taken we expect to have the ventilation at all our mines practically perfect in the course of the near future. With the help of all our men we hope to approach, as nearly as possible, ideal conditions of working underground.

SURFACE INVESTIGATIONS.

Special investigations have also for some time been taking place in connection with important branches of work on the surface. We are everywhere trying to increase efficiency and prevent waste. Reduction costs on the surface, that is, the cost of all surface operations between the shaft and the tailings dump, have recently been showing a steady decline on our group. For the whole of the year 1912 the average cost was 4s. 1.8d., while for the last four months of that year it had fallen to 3s. 10.4d. per ton. For the first five months of 1913 there is a further small reduction. Other items, such as the use of compressed air, rock drill machine maintenance, and workshop expenses, have received special attention, and very appreciable savings are being effected.

POWER DEVELOPMENT.

As regards power, our mines are now obtaining about 85 per cent. of their total power in the form of electricity and compressed air from the Rand Mines Power Supply Company, Ltd. The full supply of compressed air should be available for our mines shortly after the commencement of 1914. By the end of that year we hope also to have sufficient electric power, together with the additional safety margin for which we have stipulated in our contract, but which has so far never been available. On the whole, the supply of power has been as reliable and satisfactory as could have been expected. Less trouble has been experienced in handling this power than was anticipated in some quarters; this is especially true in regard to the powerful electrically-driven winding engines, which have run most smoothly. In no other part of the world is hoisting by electricity carried on upon so large a scale as on the Witwatersrand.

WATER SUPPLY.

During the year 1912, and also during the current year, we have spent considerable sums to augment our water supply. To-day our main water system is connected with all our mines, from Crown Mines on the west to the Rose Deep on the east, a distance of over ten miles. It is fed from Booysens Reservoir on the west and Rosherville Reservoir on the east, which are now being augmented by a system of pipe lines and pumping plant extending from Durban Roodepoort Deep to Booysens Reservoir, a distance of 10½ miles, delivering the surplus water of the Durban Roodepoort Deep, the Bantjes Consolidated Mines, and the Canada Dam owned by the Consolidated Main Reef Company. The water supply of all the mines belonging to this central group is assured until well into the next rainy season. On the far east we have certain rights over the Geduld Dam, which amply safeguard the requirements of the Modder B. and New Modderfontein companies, as long as the Geduld mine is pumping anything like the large amount of water at present raised (about 1,750,000 gallons a day), most of which flows into this reservoir. It is to be regretted that the Government of the Union has not seen its way to allow certain dormant underground supplies on the Western Rand to be temporarily utilised by the Rand Water Board during the time which must elapse before the large catchment area scheme which is being considered can furnish a really reliable and adequate supply of water to the town of Johannesburg, to the various Reef Municipalities, and to the mines.

INCREASING NATIVE LABOUR.

As far as native labour is concerned, the available supply has continued to grow. In April of this year there were 221,380 natives employed by the gold mines in the Transvaal. For the three previous years the figures were: April, 1912, 214,933; April, 1911, 211,135; April, 1910, 200,338. Exclusive of Tropical natives, these numbers are reduced to: April, 1913, 202,191; April, 1912, 193,117; April, 1911, 187,350; April, 1910, 181,931. The continued high death-rate among Tropical natives has induced the Union Government to suspend all recruiting in Tropical areas.

VICTIMS OF PNEUMONIA.

The main cause of death among the tropicals is pneumonia, and to a lesser extent meningitis and intestinal diseases. The diseases mentioned accounted for nearly 80 per cent. of the total deaths in the W.N.L.A. Compound up to the end of last year. There is an impression abroad that the death-rate among the Kaffir workers on the Rand is unparalleled. This is not the case. It is difficult to obtain figures for the purpose of comparison, as in most industries elsewhere, where work is done by white and coloured workers, as in the Southern States of America, no mortality statistics are published. Comparing the mortality from disease of all our Kaffirs with that of all the Kaffirs working in the mines of Southern Rhodesia, the death-rate per thousand per annum for the past seven years has averaged:

	Transvaal Mines.	Mines of Southern Rhodesia.
Pneumonia	12.6	25.4
Other diseases	17.8	18.7
Total	30.4	44.1

It would be interesting to compare the death rate of Tropicals in Southern Rhodesia and on the Rand, but that cannot be done, as the mortality of Tropicals in Southern Rhodesia is not shown separately. On the Panama Canal, under the French regime, the death-rate of the negro workers was extremely heavy, probably much heavier than has ever been the case here, but it was also due chiefly to pneumonia, meningitis and intestinal diseases. For the past four years the Isthmian Canal Sanitation Department have succeeded in keeping the death-rate of their negro workers below nine per thousand per annum. With the adoption of methods similar to those by which the American Administration have achieved such striking success in the Panama it ought to be possible for our companies also to obtain satisfactory results. This matter is receiving the most careful attention not only of our medical advisers, but also of all concerned in the management of our mines. We have recently, in consequence of Sir Almroth Wright's investigations, been inoculating mine natives with vaccine which, it is hoped, will lessen the incidence of pneumonia and kindred respiratory diseases. I have stated that the general supply of labour has steadily grown. Unfortunately, it has not kept pace with the ever-increasing demands. There is at many mines a severe shortage of labour to-day, and this is affecting the working profits.

MECHANICAL APPLIANCES.

At the same time, there is a strong tendency to make more use of mechanical appliances in every possible direction. The use of small rock drills underground is growing, as the following figures, taken from our group of mines, indicate:—

December.	Tons broken (stopes only). Hand.	Large machines.	Small machines.
1910	218,453	282,343	15,297
1911	161,661	313,617	75,851
1912	174,197	318,319	110,009

These figures are instructive, as they show that hand labour for breaking rock is gradually being replaced by small machines. In other words, we are doing our utmost to become less dependent on the native labour force.

CHANCE FOR INVENTOR.

It must be admitted that the ideal small machine has not been discovered. I mean the small machine easily carried about and worked by one native, simple in mechanism, cheap in cost of upkeep, and capable of replacing the native on hand-stoping under normal conditions. On the other hand, it seems not unlikely, in view of the immense value of such a machine, that something suitable will be evolved in course of time—possibly before very long. It is scarcely an exaggeration to say that when this does take place, our native labour difficulties will have been overcome to a considerable extent. There appears also to be scope for obtaining better results by giving more encouragement to natives employed on large rock drill machines, which is probably the most difficult work that natives have now to perform. Systems of piecework have been generally introduced for these natives on the mines, but a limitation has been placed by the new recruiting corporation on the average earnings of this class of labour at each property. This policy of limiting efficiency appears to us to be wrong. We had at the end of last year 371 white learners in the reduction works on our mines. Sixty-five of these have actually passed beyond the learner stage, they have become regular employees, and their average pay is £22 per month, after a period of service of a little over two years. We have also now 196 learners underground. We are taking steps to offer white employees cheap land so as to help them to found their homes here. The Geldenhuis Deep owns a fine stretch of land, consisting of about 1,800 acres, to the north of the reef, which it is intended to offer to employees of this and other companies as soon as sufficient water has been found in the boreholes that are being sunk. The lots will probably vary in size from one acre to a little over two acres, and the price will be considerably below current market rates. At other places, such as on the City Deep and probably on the Modder B., we propose, in the near future, to ask for permission to create townships with the intention of offering the ground at low rates to the white men in our employ. It will be worth a great deal to our companies if they can attract and settle the best type of workmen.

BEWAARPLAATSEN.

I had hoped to be able to congratulate the Government on the passing into law of its recent Bewaarplaatsen Bill, which was drafted

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on the lines of the Report of the Commission appointed in 1909, which recommended that the freehold owners should receive one half of the moneys accruing in respect of undermining rights. The Government, unfortunately, had no time to deal with this Bill at the last moment, and nothing has been done this session.

I desire to place on record the Board's appreciation of the services of all our officials. I refer especially to the good work done by Messrs. H. Stuart Martin, B. Madew, P. Cazalet (our consulting engineers); to Mr. J. H. Rider, our chief mechanical and electrical engineer, and to Mr. E. G. Izod, his assistant; to Mr. F. L. Bosqui, our chief metallurgist, and to his assistants, Messrs. F. Wartenweiler, K. L. Graham, and J. Thurlow; also to Mr. F. Raleigh, our financial manager; Messrs. H. A. Read and S. C. Steil, the secretaries; to Mr. A. Moir, the London secretary; to Mr. F. H. Barry, the transfer secretary; to our buyer, Mr. H. R. Netherside; our inspecting accountant, Mr. S. C. Mosel; and to the entire staff.

FRENCH SHAREHOLDERS.

Mr. E. J. Renaud said: I have much pleasure in seconding the adoption of the report and accounts before us. In doing so I would like to make a few remarks upon certain points which appear to me to be of interest to our shareholders. The Chairman has given you a clear and complete view of the present ore reserves of each mine of which your company has the control. I will, therefore, confine myself to saying that we shareholders have to congratulate ourselves on the results attained. If we compare last year's reserves with those of 1911, we see that they have augmented by nearly 1,200,000 tons, while the values have slightly risen. Developments at the lowest levels of practically all the mines show, as pointed out by the Chairman, very good values, thus reducing to nothing, as far as our mines are concerned, the theories advanced by many outside critics to the effect that the value of the reef diminishes at depth. Of course, we cannot see through the rock, but, considering that some companies are at present developing their property at a depth of over 4,000 feet, with very high values, we are justified in hoping that these values can be expected to continue to the limit of depth at which it will be possible to work these huge deposits at a profit. What that limit will be it is obviously impossible to say at this juncture, as the factors to be taken into account are many and fluctuating. Too much cannot be said in support of the policy of strong ore reserves to which the Chairman has alluded. A strong ore reserve position gives the management a certain measure of desirable elasticity; it also enables shareholders to look forward with confidence to the future of the companies in which they are interested.

CASH RESERVES.

This question of ore reserves brings me to a point on which I can voice the feelings of many French shareholders. I refer to the creation of cash reserves. I am aware that many shareholders hold the view that the whole of the available funds of companies should revert to them in the shape of dividends. To follow such a policy too closely would, in my opinion, be fraught with danger. It might render difficult the payment of regular dividends, a condition very necessary in order to prevent violent fluctuations in the price of investment shares. In addition to this, it should be remembered that capital expenditure really never comes to an end in a mine, as, even in the case of companies whose programme has been completed, considerable expenditure may unexpectedly have to be incurred owing to unforeseen circumstances, or even for the purpose of bringing about a reduction in working costs. The aim of a careful company director should be, in my opinion, to pay such dividends as will always leave the company with a substantial margin of ready cash available either for contingencies or for dividend equalisation purposes. I would therefore advocate, Mr. Chairman, the creation on these fields of strong cash reserves; and, as I have already said, in doing so I am voicing the sentiments of many French shareholders.

SELECTIVE MINING.

In your speech, Mr. Chairman, you have alluded to the so-called "selective mining" and the criticism to which it has given rise. I endorse absolutely your views when you say that, for you, "selective mining" means working all payable ore and avoiding all unpayable ore as far as possible. This has a great bearing on working costs, and of course many critics will tell you that working rich ore and poor ore together will be of advantage to shareholders, as the mine will be worked to a greater extent than by selective mining. These critics lose sight of the fact that the loss arising from the poor ore has to be made good by the rich ore, thus reducing the total profit proportionately. They may say that lower working costs are obtained in the way advocated by them, but if they calculate the cost at per ounce recovered instead of at per ton milled, they will realise their error. On the other hand, it must be admitted that it is impossible always to prevent stoping poor ore with rich ore—as, for example, when both are intermixed in the same face. In such case, I approve of their being worked together, as, if the poor ore is left in the mine after it has been broken, the loss would perhaps be greater than if it had been extracted and treated. But whenever the unpayable ore in situ can be left in the mine without being stoped, I contend that it would be most unwise to stope it with the only object of feeding our mills and without any chance of increasing our profit. I hope and I think working costs will be reduced in the near future without resorting to the milling of unpayable rock, and I believe that sand-filling, by rendering the mines safer, reducing in the long run the cost of maintenance of the workings (old or new), and by facilitating ventilation through a reduction of the area through which the air can be directed to or from the working faces, will also be recognised in the near future as a money-saving device. Another reason which makes me support selective mining, as defined by you, is that ways and means may yet be found of turning to account the unpayable ore left in the mines. We all think that improvements will take place, as we cannot say that we have yet attained perfection in either mining or metallurgy. The next generation may bring about a revolution in all our present processes: who can tell the contrary? In these circumstances it would, in my opinion, be foolish to work to-day at a loss rock which will perhaps in the near future yield a profit.

TOO MUCH TAXATION.

It is common knowledge that for some time past it has been difficult to raise funds in Europe for the development of the Rand. As we all know, there are thousands of payable gold-bearing claims which are awaiting European capital for their opening up and exploitation. I need only refer to the huge areas on the far eastern Rand which have been lately placed before the investing public by the Government of the Union of South Africa. The utter lack of response with which these offers have been received is, in my opinion, traceable mostly to the already heavy taxes which are being levied on the mining industry, to the fear of further taxes and—to some extent—to the exaggerated ideas of those who control the destinies of South Africa as to the share of profit that should accrue to the State, which was prepared to share in none of the *risks* to be incurred. The essential features of a good tax are that it shall be a fair burden, that it shall produce revenue, and that its collection shall be as free from vexation as possible. Especially, it must not by its incidence reduce the source upon which the tax is imposed. It is, as affecting the French shareholders more especially, that I claim that in the above-mentioned essentials the Transvaal Estate Duty Act and the Union Stamp Act are both wanting. To explain: Transvaal estate duty is levied on estates containing assets in the Transvaal of the value of £2,000 and upwards. Now, although the amount of shares held by French shareholders is very large in the aggregate, the *registered* shareholdings are individually small, with the result that this tax, as a matter of fact, produces no revenue in these instances; while, on the other hand, all the small estates are put to the expense of affidavits and other legal requirements in order to obtain the necessary certificate of exemption from payment of the duty.

DETERRENT TO INVESTMENT.

It is obvious, therefore, that this tax, whilst producing little or no revenue, through the irritation caused and the expense incurred in obtaining exemption from its burden, acts as a serious deterrent to the investment of European capital in South Africa. To turn to the Union Stamp Duty and Fees Act and its provisions as to stamp duty on marketable securities, I maintain that it is unfair, and that its collection should be restricted to transactions and securities actually in this country. It is unfair that a French shareholder should have three duties to pay if he wishes to purchase shares of this company before he can have the shares registered in his name. He has to pay the French fiscal charges, English stamp duty, and Union of South Africa stamp duty. This direct taxation, outside the confines of your own country, is bad finance. Shareholders' grievances are far from being imaginary, as some might be inclined to think; they are felt especially by the French investing public. French shareholders are looking with alarm at the ever-increasing taxation which is imposed on the mines in which they have invested hard-earned money, and last year—when, it will be remembered, a new taxation was about to be imposed on South African shares in the way of estate duty on bearer-warrants—vigorous protests were received from the French investing public and others, with the result that the proposal was withdrawn. Unreasonably high taxation carries unpopularity with it, and renders further flotations extremely difficult. If I may, therefore, be permitted to express an opinion, I would warn South African legislators against the unwisdom of continuing to impose additional burdens upon shareholders of Rand mining companies. I now beg to second the adoption of the report and accounts for the year ended the 31st December, 1912.

CHAIRMAN'S REPLY.

The Chairman: Before putting the adoption of the reports to the meeting, I may perhaps be allowed to traverse the main points raised by Mr. Renaud. First, on the question of taxation, I have no doubt whatever that the remarks made by Mr. Renaud, who represents a very large number of Continental shareholders, will receive the careful attention of the Union Government. I assume that Mr. Renaud will forward his remarks through the French Consul-General to the Government, so that the Government may receive them direct in that way. I think it must be obvious that if a country like South Africa requires money, as it certainly does for general development, not only for the mines, fair inducements should be held out to investors in Europe. This is a point that might well be impressed clearly on South African legislators in the interests of South Africa. I turn now to the question of cash reserves. As far as the Rand

First Class Mining Positions

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics. — E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, Corner Eloff and Pritchard Streets. Box 2061.

Mines, Limited, are concerned, you know that we have held large cash reserves for a number of years, and as I mentioned in the early part of my address, our cash reserves at the end of 1912 amounted to a little over £524,000, as can also be seen from the balance sheet. As far as mining companies are concerned, a number of older companies, such as the Robinson, the Ferreira (now absorbed in the Ferreira Deep), and others have for a very considerable period of time possessed strong cash reserves, and these cash reserves are naturally of the greatest value to mines of comparatively short lives approaching their end, because they are thereby enabled to make terms infinitely better than they would otherwise be able to do with the object of extending their existence in some form or another.

STRONGER POSITION.

Most of our other companies, apart from these older ones, have, as you know, during the last few years been passing through a period of reorganisation following amalgamation. There has been heavy expenditure during that time, and it has been impossible in most instances to create cash reserves or even to commence creating them. At the same time, it must be obvious that the position of these companies is infinitely stronger to-day than it was before amalgamation took place. They are specially stronger in regard to their ore reserves, which form really the first step towards creating cash reserves. I may perhaps be allowed to take as an instance the Crown Mines, the only company of ours which to-day has a debt. The Crown Mines has a debt of £1,000,000 in debentures, has a further capital expenditure to incur, as outlined in the recent speech of the chairman, amounting to £166,000; it also has further liabilities of £136,000, which are more or less balanced by cash and cash assets amounting to £133,000. Assuming that the total liabilities for the time being are in the neighbourhood of £1,200,000, or even a little more, you have now ore reserves amounting to 10,049,000 tons, representing gold to the value of £14,772,000, and, as I mentioned, profits in sight amounting to approximately £6,250,000. The mine to-day is undoubtedly in a very strong position, and is well ahead of the mill. If we had labour there would be no difficulty in crushing 230,000 tons a month, and it is easy for you to figure approximately what the profits would then be. The formation of cash reserves must be considered carefully, the conditions of each company being taken into special consideration. Of our newer companies I may give as an example the Modder B., which made an excellent start, has been earning very good profits, and after declaring a dividend of 4s. at the end of this month, as we expect to do, will have free cash amounting to £104,000. This will show you that we admit the soundness of the principle laid down by Mr. Renaud, that companies should have a strong cash reserve; at the same time all companies cannot move equally fast, and I think you will acknowledge that, while the principle of having cash reserves is undoubtedly sound, careful consideration must be given to each individual case. There must be no undue precipitation, and especially in the case of mines with long lives there should be no undue interference with declarations of dividends in commencing the formation of these cash reserves. The report and accounts were unanimously adopted.

Contracts Open.

For supply and delivery of laundry plant, steam boilers and cooking apparatus, Alexandra Hospital, Maitland, Cape (Aug. 6).

For supply and repair of typewriters to Union Government (June 11).

For supply and delivery of steel furniture and fittings and fixing, Union Buildings, Pretoria (Sept. 3).

For erection of bridge, Natal Spruit, Alberton, district Witwatersrand; alterations and additions, nurses' home, Boksburg Hospital; erection of new native wards, Boksburg Hospital; installation of heating and hot water supply, Boksburg Hospital; erection of school, Lichtenburg, district Potchefstroom, and supply, delivery and fixing in position where necessary; certain science fittings, school Lichtenburg, district Potchefstroom (June 13).

For conveyance of posts, between " Cross Roads " to Hlatikulu, via P.O. Mahamba (June 25).

For additions, school buildings, Booysens, district Johannesburg; for supply, delivery and fixing in position where required, certain science fittings, High School, Krugersdorp; for erection of school and teachers' quarters, Vlakplaats No. 313, Heidelberg (June 20).

For printing to General Post Office (7,200 pads) (June 18).

For supply of dry cells to Department of Posts and Telegraphs (June 18).

For alterations and additions to National Hospital, Bloemfontein; and additions to Boys' School, Bethlehem (June 17).

For pumping plant and fencing gates, Durban Harbour (July 15).

For erection of bridge over Nondweni River, N'Qutu Division (June 23).

For insurance of public buildings in Rhodesia against fire (June 13).

For building manholes, Posts and Telegraphs Department, Bulawayo (June 27).

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's: Holloway Company	8.15
Standard	8.15
Empire	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9

INVESTORS' DIARY.

The following company meetings have been announced:—

June 27.—A. Goerz and Co.
July 4.—General Mining and Finance Corporation.
July 31.—Glynn's Lydenburg (Special).
Aug. 5.—City Deep.
Aug. 26.—Glynn's Lydenburg (Special).
Aug. 26.—Transvaal Gold Mining Estates (special).
Sept. 19.—Transvaal Gold Mining Estates (special).

General Mining and Finance Corporation, Limited.

(Incorporated in the Transvaal).

General Mining Buildings,
Johannesburg, 22nd May, 1913.

NOTICE IS HEREBY GIVEN that the Thirteenth Ordinary General Meeting of Shareholders of the General Mining and Finance Corporation, Limited, will be held in the Board Room, General Mining Building, Johannesburg, on FRIDAY, the 4th day of JULY, 1913, at 11 a.m., for the following purposes:—

1. To receive and consider the Balance Sheet and Profit and Loss Account, and the Directors' and Auditor's Reports for the year ended 31st December, 1912.
2. To elect Directors in place of Geh. Kommerzienrat Eugen Gutmann and Jacob Freudenthal, who retire in terms of the Articles of Association, but who are eligible, and offer themselves for re-election.
3. To appoint an Auditor or Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors.
4. To transact any other business which ought to be transacted at an Ordinary General Meeting.

The Share Transfer Books of the Corporation will be closed as follows:—

(a) At the Head Office from the 30th of June to the 18th of July, 1913, both days inclusive.
(b) In London from the 2nd of June to the 8th of June, 1913, both days inclusive.

Holders of Share Warrants to Bearer desiring to be present or represented at the Meeting should deposit their Shares at the places and within the times following:—

Johannesburg:—At the Head Office of the Corporation, General Mining Buildings, at least three days before the time appointed for the holding of the Meeting; or
London:—At the London Office, (Transfer Department) Winchester House, Old Broad Street, E.C.:
Berlin:—At the Berlin Office, 51, Markgrafenstrasse; at the Dresdner Bank, Behrenstrasse, 38/39; at the Direction der Disconto-Gesellschaft, Behrenstrasse, 43/44; at the firm of S. Bleichroeder, Behrenstrasse, 63; at the A. Schaaffhausen'scher Bankverein, Franzosischestrasse, 53/55
Paris:—At the Paris Office, 29, Rue Taitbout; at the Bank de l'Union Parisienne, 7, Rue Chauchat;
Basle:—At the Schweizerische Bankverein;
Zurich:—At the Schweizerische Kreditanstalt;
at least thirty days before the date appointed for the holding of the Meeting.

By Order of the Board,
W. H. BETZ,
Secretary.

Rhodesian Section.

LATEST MINING NEWS.

Improvements at the Bush Tick—Globe and Phoenix Developments—Rich Strike near Gwelo—A Wood Cutting Contract—Eileen Alannah's Plant—A Mining Commissioner Retiring.—Planet-Arcturus

IT is interesting to note that the Bushtick Mines, Ltd., since the reorganisation of the plant and the addition of six Nissen stamps has been making steady increases to the monthly output. Results for the past quarter are:—

	Tons milled.	Yield fine ozs	Sands & Slimes: Tons treated.	Yield fine ozs.
March	6,128	236·27	6,191	834·40
April	6,036	256·43	6,220	851·62
May	6,106	210·38	6,389	1,067·73

Total yield (fine ozs.): March, 1,070·67, value £4,487; April, 1,108·05, value £4,619 18s. 3d.; May, 1,308·11, value £5,513. Shaft sinking in the two main shafts has been resumed, and development values are improving at depth. The results for May were:—Mill ran, 25·1 days; crushed, 6,106 tons; yield, 210·38 ozs. fine gold; sands and slimes treated, 6,389 tons; yield, 1,067.73 ozs. fine gold; total yield, 1,308·11 ozs. fine gold; total estimated value, £5,513; duty per stamp per 24 hours equalled 10·13 tons.

* * * *

The following shows the developments on the Globe and Phoenix mine during the month of April: The actual widths of the reefs and the actual assay values are given, except where the width of the reef is below 30 inches. In these cases, as a minimum width of 30 inches of rock must be removed for stoping, the value is given as the average value for the whole 30 inches width, *e.g.*, if a 10 inch reef assayed 36 dwts. the average value over the stoping width of 30 inches would be 12 dwts., and would be as stated. New main shaft, total depth 814 feet. No. 12 level: No. 1 winze south from main shaft has advanced 11 feet; average width of reef, 10 inches; average value, nil. No. 12 level, Station Reef: Intermediate drive north from No. 1 winze south has advanced 19 feet; average width of reef, 12 inches; average value over 30 inches, 7 dwts. No. 12 level, drive north, No. 1 crosscut: East drive south from crosscut has advanced 69 feet; average width of reef, 9 inches; average value over 30 inches, 36 dwts. No. 18 level, west portion: No. 1 winze on footwall reef has advanced 36 feet; average width of reef, 34 inches; average value, 10 dwts. No. 18 level, west portion: No. 1 raise on footwall reef has advanced 13 feet; average width of reef, 25 inches; average value over 30 inches, 2 dwts. No. 18 level, east portion: No. 2a winze intermediate (150 feet south of No. 2a winze) has advanced 15 feet; average width of reef, 11 inches; average value over 30 inches, 7 dwts. No. 18 level: Drive north from 2a winze east reef has advanced 19 feet; average width of reef, 4 inches; average value over 30 inches, 1 dwt. No. 19 level. Drive north from No. 2a winze (prospecting on line of combined reef) has advanced 117 feet; average width of reef, 6 inches; average value over 30 inches, 52 dwts. 19th level: No. 2 winze north, 19th to 20th level, west reef, has advanced 37 feet; average width of reef, 16 inches; average value over 30 inches, 8 dwts. 19th level: No. 1 winze north, 19th-20th level, west reef, has advanced 21 feet; average width of reef, 8 inches; average value over 30 inches, 6 dwts. Crosscutting for month, 13 feet.

* * * *

News has just reached Gwelo, says the local paper, of a very rich strike on the Sunstar claims, Que Que district. Development work has steadily been proceeding here for the last twelve months on a different reef altogether, and it was in crosscutting on this reef that the new find was discovered. Mr. W. Renton, who is carrying out the development, was in town this week, and brought a box of very rich ore with him. We believe that an offer to take the ground up on option has been made and refused, as it is the intention of the owners, Messrs. Ernie Gray and R. Renton, to erect a plant at an early date. This is an east parallel reef to the Cactus, lately under option to Willoughby's Consolidated Company, but, unlike the Cactus, this new reef is entirely free milling.

* * * *

The chief bone of contention at the recent meeting of the Small Workers' Association at Hartley was with reference to the big wood contract for the Cam and Motor mine, which was in the hands of Messrs. Drayton Brothers. The secretary read a considerable number of letters, as between the mine owners of Shagari, the Cam and Motor people, and the contractors. The original survey flags for the tramline that has been laid from Eiffel Flats (Cam and Motor) to the wood-cutting area, indicated that the intention was to cut wood in the Shagari district, thereby, it was contended, crippling the small worker. There was a long and animated discussion, in which Messrs. Montagu, Begbie, Masters, Tavener, Wiggings and a number of others took part. Mr. Montagu said that, in accordance with the law, every mine owner had the right to cut wood for mining purposes where he pleased, but he gave them the assurance that he would do his very best to meet the wishes of the Shagari mining people. He had only just received a letter, dated 5th June, 1913, from the office of the company, attaching a plan showing the route of the railway, which was a long way—ten miles or so—from the area where the Shagari people cut their wood, and they had arranged to cut only to the north and east towards Hartley and Gadzema. This did not entirely satisfy the meeting, and ultimately, on the proposal of Mr. Tavener, seconded by Mr. Banner, it was resolved that the secretary write to the Cam and Motor Company, and, while not claiming it as a right, ask for an assurance that woodcutting will not take place more than a mile to the west of the tramline, as per plan submitted.

* * * *

Mr. McCleary, a mechanical engineer from the Modderfontein mine, has arrived at Gatooma. He has been sent up specially to lay out the plant for the Eileen Alannah mine, or, in other words, he is to arrange, according to plans, the ground and foundations, in anticipation of the arrival of the machinery and plant. Mr. Burnett is to be the new manager of the Eileen Alannah.

* * * *

The news that Mr. F. S. Broun, Mining Commissioner of Hartley, was about to retire on pension on account of continued ill-health, has been received with universal regret. At the small workers' meeting, his health was felicitously proposed by a gentleman present, and Mr. C. G. Woodforde, late manager of the Cam and Motor, also endorsed the speaker's remarks in eulogistic terms, emphasising the consistent courtesy that Mr. Broun had always accorded the mining community.

* * * *

The following is taken from the development statement of the Planet Arcturus for the quarter ended December 31: Ore developed for quarter: Slate mine, 10,697 tons; Arcturas, 42,414 tons; Planet, 2,993 tons; total, 56,104 tons. Ore in sight as at December 31, 1912: Slate mine, 87,809 tons; Arcturus, 106,566 tons; Planet, 12,485 tons; total, 206,860 tons.

THE WEEK IN THE SHAREMARKET.

Easier After a Spurt—Strike and Balkan News Restricts Activity.

The week opened under good auspices, and on Tuesday morning quite an optimistic feeling prevailed. As the week wore on, however, and strike news failed to improve, the market eased. The fact that the Van Ryn men have now come out has not improved matters, and the market must, of course, perforce await developments. The news from the Balkans likewise is less reassuring, and everything seems to conspire against the advent of the long-expected good market. The Rand dividend declarations are a little later than usual, due doubtless to the strike trouble, and this fact is also not encouraging. At any moment, however, the position may change, and with the removal of the restrictive factors named, there ought to be a considerable revival of activity. Apart from the uniform movements in Rand stocks, the features of the week have been the temporary weakness in Zaaiplaats, the marked demand for Crown Diamonds, and the recovery in Frank Smiths. In a better market these stocks will doubtless enjoy considerable activity.

	Friday, 13th.	Sat., 14th.	Mon., 16th.	Tues., 17th.	Wed., 18th.	Thur. 19th.
African Farms ..	16 9	16 9	16 9	16 6B	16 6	16 3
Apex Mines ..	23 6	23 6B	23 0	23 6B	—	—
Bantjes Cons. ..	20 9B	—	20 9B	20 9B	20 9B	20 6B
Benoni Cons. ..	3 1B	3 0B	3 0B	3 3	3 3B	3 3B
Brakpan Mines ..	73 0	72 0B	72 0B	72 0B	72 6S	72 0S
Breyten Collieries..	—	—	—	—	—	30 6B
British S.A. ..	—	20 0B	20 0B	—	—	19 6B
Bushveld Tins ..	0 7B	0 7B	0 7B	—	0 6B	0 11S
Cassel Coals ..	15 0B	15 0B	—	—	—	—
Cinderella Cons. ..	6 3B	7 0B	—	8 6B	—	9 0B
City & Subs. (£4) ..	49 0B	50 0B	50 0	50 6	51 0	50 0B
City Deeps.. ..	58 6B	59 0B	*59 6	59 6	58 6	58 0B
Cloverfield Mines ..	5 1B	5 3B	5 3B	5 5	5 3B	5 1B
Clydesdale Colls. ..	8 0B	8 6B	8 6B	8 6B	—	—
Cons. Investment	21 0B	21 0B	21 0B	21 0B	—	—
Cons. Langlaagtes	24 9B	25 6B	25 9B	26 0B	26 6	26 0B
Cons. Main Reef ..	18 0B	18 6B	18 6B	18 6B	18 9B	18 6
Cons. Mine Select	14 0S	—	14 0S	—	—	14 0S
Coronation Colls. ..	—	—	15 0B	—	—	—
Coronation Freeholds	0 5B	0 6S	—	0 3B	0 3B	0 5S
Coronation Synd.	—	—	3 6B	—	—	—
Crown Diamonds ..	10 6	11 6	11 9B	14 0	13 6	13 0B
Crown Mines ..	—	—	140 0B	140 0B	—	—
Doornhoek Tin ..	—	—	—	—	—	2 6B
East Rand Centrals	9 3	9 0B	9 3B	9 0B	9 0B	8 9B
E. Rand Coals (2/6)	1 10	1 9B	1 9B	1 9B	1 9B	1 10B
East Rand Deeps..	2 5B	—	2 4B	—	—	2 6S
East Rand Props. ..	52 0B	53 0	53 0B	52 6B	52 0B	53 3
East Rand Debs. ..	£90B	£93S	£90B	£93	£91B	£93S
Eastern Golds (1/-)	—	1 6B	1 6B	—	—	—
Frank Smith Diam.	13 3	13 0B	12 9	12 6	12 9	13 6
Geduld Props. ..	23 6	23 3	23 0B	23 3B	22 9B	22 6B
Glencairns	—	—	—	3 0B	—	—
Glencoe (Natal) Colls.	7 3B	7 6B	7 6B	7 3B	7 0B	7 3B
Glynn's Lydenburgs	18 0S	17 6B	17 6B	17 6B	18 0S	17 6B
Government Areas	23 3	23 6	23 9	23 6	23 3	23 3
Hex River Expls.	0 7B	0 7B	0 6B	0 7B	0 7B	0 7B
Jumpers	5 0S	—	4 0B	4 0B	—	—
Jupiters	8 0	8 3B	8 6B	8 6B	8 6B	8 6B
Kaalfontein D. (2/6)	0 4B	0 4B	0 4B	0 4B	—	0 4B
Klerksdorp Props.	2 3B	—	2 3B	2 3B	2 3B	2 3B
Knight Centrals ..	10 0	10 0B	10 3	10 0	9 9B	10 3S
Lace Props. ..	3 6	3 6B	3 9	3 7	3 6B	3 9S
Luipaardsvlei Est.	9 0B	9 0B	8 9B	—	—	—
Lydenburg G. Fms.	3 6	3 6B	—	3 6	3 6	3 6
Main Reef Wests ..	8 6B	9 6	10 0	9 6B	9 6B	9 9
Middlevlei Estates	1 0B	1 0B	—	1 0B	—	—
Modder B's ..	75 6B	76 6B	77 0B	77 6B	77 3	77 0
Modder Deeps ..	34 0B	34 6	34 0	32 6B	32 9B	33 0
Natal Navigation Col.	15 0B	16 0S	16 0S	—	15 0B	—
New Boksburgs ..	1 0B	1 0B	1 0B	—	1 0B	1 0B
New Eland Diam.	29 0S	25 0†	—	—	—	29 0S
New Era Cons. (5/-)	7 3B	7 3	7 3	7 0B	7 0B	7 6S
New Geduld Deeps	2 6B	2 7B	2 7B	2 8	2 7B	2 7B
New Kleinfonteins	21 6B	22 0	22 0	22 0B	22 0B	21 9B
New Modders ..	255 0B	255 0B	—	—	—	—
New Rietfonteins	—	4 9B	4 6B	4 9B	—	5 0
New Unifieds ..	16 0S	16 0S	16 0S	16 0S	15 0B	15 6B
Nigels	—	—	18 0	—	19 0B	19 0B
O.F.S. & Trans. Dia.	1 9B	1 9B	—	1 10	1 9B	1 9B
Pickstone Golds ..	—	40 0B	—	—	—	—
Premiers Def. (2/6)	—	—	—	252 6B	—	—
Pretoria Cement Co.	55 0S	55 0S	—	54 6	54 0B	56 0S
Princess	6 0B	6 0B	6 0B	6 0B	6 3B	6 0B
Rand Collieries ..	5 3S	5 6S	—	5 0S	5 0S	—
Rand Klips ..	1 7	1 7B	1 7B	1 6B	1 7B	1 7B
Rand Nucleus ..	2 9B	2 4B	2 0B	2 4B	2 3B	2 6S
Randfontein Deeps	4 0B	1 3	4 3B	4 3B	3 9B	—
Randfontein Estates	26 3B	26 3B	26 6B	26 9B	26 3B	26 0B
Roberts Victors ..	31 0B	32 0B	31 0B	33 0B	33 9B	36 6B
Robinson Deeps ..	34 0B	33 9B	33 6B	34 6B	34 0B	—
Rooiberg Minerals..	38 3	38 0B	37 6B	37 9B	37 9B	37 0B
Rood. Durban Deeps	22 0B	22 6B	22 9B	22 9B	23 6B	—
Rose Deeps ..	—	61 3B	—	—	—	—
Ryan Nigels ..	3 6B	—	—	—	3 6B	3 6B
Shebas	—	5 3B	5 0B	4 10B	4 10B	4 10B
Simmer Deeps ..	—	—	—	3 0	—	—
S.A. Breweries ..	40 6B	—	40 6	—	—	40 0B
S.A. Lands ..	3 7B	3 8B	3 7B	3 7B	3 7B	3 6B
Springs Mines ..	17 3	17 9	17 6B	17 6B	17 3B	17 3B
Sub Nigels ..	13 0B	13 3B	13 0B	13 0B	—	12 9B
Swaziland Tins ..	49 0B	—	49 0B	50 6B	50 6B	50 0
Trans. & Delagoa ..	40 0B	—	—	—	—	—
Trans. Coal Trusts	45 0B	45 6	44 9B	—	44 0B	43 0B
Trans. Cons. Lands	25 0B	—	—	—	—	—
Trans. G.M. Estates	52 0B	52 0B	51 0B	51 6B	52 0B	52 0B
Van Ryn Deeps ..	32 6	33 3	33 3	33 0	32 0	31 3
Village Deeps ..	40 0B	41 6B	41 6B	41 6B	41 6B	41 6B
West Rand Estates	—	—	3 6B	—	—	—
Witbank Collieries	—	44 0B	44 0B	—	—	—
Witwatersrands ..	71 0B	72 0	71 0B	71 0B	70 0B	71 6B
Wit. Deeps ..	62 0*	61 9B	62 3B	61 9B	62 0B	61 6
Wolhuters	15 3	15 0	15 3B	15 3B	15 0B	15 0B
Zaaiplaats Tins ..	50 0	49 0B	49 3	48 9	47 3	46 3

B Buyers. S Sellers. *Ex-London. †12 Shares.

Swaziland Tin.

A dividend, No. 13 of 20 per cent. (4s. per share), payable at 30th June, 1913, has been declared.

Langlaagte Estate.

The report for the three months ended the 31st March on operations at the Langlaagte Estate shows that from 160,124 tons milled 41,537.804 ozs. of gold were recovered. The revenue from gold was £174,583, or 22s. 7.07d. per ton. General revenue received was £6,258, making a total of £180,854. Total working costs were £136,017, or 16s. 11.87d. per ton, which left a profit for the quarter of £44,836, or 5s. 7.2d. per ton. Expenditure on capital account for the period was £5,270. The total ore reserves at the 31st March were 1,315,725 tons. The supply of native labour is sufficient for requirements.

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

South African Mining Journal

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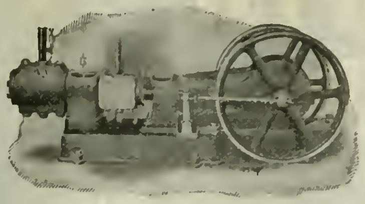
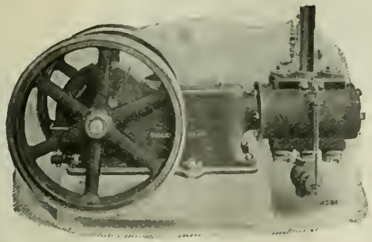
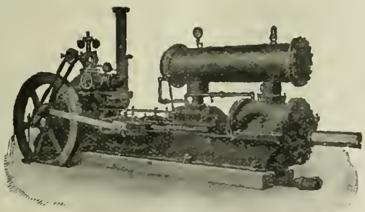
The Offices of the South African Mining Journal are now situated at Nos. 176 to 180, STOCK EXCHANGE BUILDINGS, Fox Street, Johannesburg—(2nd Floor).



Class "NF" Steam Driven Compressor.



Class "NE" Belt Driven Compressor.



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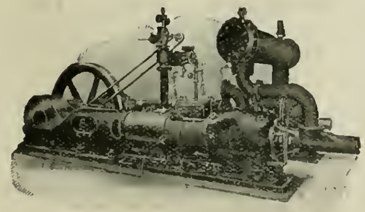

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An air compressor may represent a good design and all the elements of economical air compression—but if it has not the constitution to withstand long, hard service, it is after all a poor investment.

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Forty-two years of experience in compressor building enable us—indeed, qualify us beyond all precedent—to impart to Ingersoll-Rand Compressors the constitution which properly supports their many other features of superiority.

The design of these machines appears in the excellence of their valve movements—in the thoroughness of the cooling arrangements—in the high economy of the power end—in the low mechanical friction realized by generous bearings generously lubricated—in the minimizing of all losses between power input and power output.

And all the advantages of this high-class design are perpetuated by the use of unsurpassed materials—metals of known strength proportioned to the peculiar duties of every part in an understanding of air compressor practise nowhere to be equalled.

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Engineering Notes and News.

Power Supply on the Rand.

[BY A. E. HADLEY.]

(Discussion on paper read before the Institution of Electrical Engineers, at Manchester, March 11th, 1913.)

Dr. E. Rosenberg said that there were some remarkable features which distinguished the Rand power supply from all others. First, the incredibly high load factor, with a peak load of 88,000 kw., and sales averaging 1,350,000 units per day. This meant that the load for the twenty-four hours was equal to 15.3 times the peak load. These figures would be the envy of most central station engineers.

Mr. B. Welbourn said that in certain parts of the world, including South Africa, a good deal of trouble had been experienced in cables due to white ants. He asked if the author had experienced this on the system described in the paper. In carrying a cable network over a country of this character, there was in all probability considerable surface subsidence which might lead to trouble: had expansion joints been found necessary? With regard to the disk insulators used to build up the suspension type insulator, in view of the very frequent dust storms, he asked whether the distribution of pressure over these insulators had been affected by the accumulation of dust, especially on the 80,000-volt line. With regard to line protection, he had come to the conclusion that any form of arrester that involved a spark was distinctly a thing to avoid.

Mr. G. D. Seaton said the efficiency reports commended themselves to him very much. A good deal of bad machinery was put into use in this country because it was cheap. Anything that brought out the merits of good machinery was to be encouraged, and the author was to be congratulated for his efforts in this direction. He would like to see such methods used by municipalities; if they were, he thought some astounding results would be seen.

Mr. Lamb asked the author for an idea of the size of the cooling pond for the condensation water. The quantity of circulating water seemed to be low for the size of the plant.

Mr. J. Lustgarten asked if during the period of lightning any insulators had been punctured. The question was an important one, because out of it arose whether an insulator existed to do this work. With regard to earthing the neutral, they had learnt that for all L.T. distribution circuits earthing the neutral was the best policy, but in Mr. Peck's recent paper the conclusions come to were that on H.T. circuits the neutral should not be earthed. The reason for that was that if working with an earthed neutral and flashing over took place on any of the lines, then if this flashing over persisted and the current was large enough, the circuit breakers would trip and interrupt the supply. Recent American practice had been to work with a non-earthed neutral and to use an arc suppressor.

Mr. Coates asked if the switches in the sub-stations were of similar breaking capacity to those in the main stations.

Mr. Parry said it would be interesting to know how the cost of the 700 miles' scheme from Victoria Falls worked out in comparison with the present steam stations. Was there any reason why the power stations should not have been put down at the collieries and the power distributed from there?

Mr. W. Bolton Shaw asked what was the drop in pressure at the most distant point on the air supply system? The very small loss of 3 per cent. on the pipe line spoke well for the way in which the line had been installed.

Mr. Hadley, in reply, said they had not experienced any trouble on the cables through white ants. Owing to the very hard earth formation, subsidence was practically unknown on the reef, and therefore expansion joints were not used. There was no trouble in working overhead and underground cables together, but it had to be remembered that the 20,000-volt cables could only be connected to the 40,000-volt lines through coupling transformers. No trouble had been experienced with the suspension-type insulator due to dust. The Prat system of induced draught was one of the most interesting features of the installation; it also appealed on the question of saving freight, which was £10 per ton. Anything simplifying labour was also another great advantage. The system was so satisfactory that it had been applied on all the stations. The revision of price was entirely dependent on the cost of production, and could take place every eight years. It was based on the average cost of the preceding three years. The size of the cooling pond depended on whether it was possible to discharge at one end and take in from the other. The amount of power used in the works at Rosherville depended on whether the pond was full, so that the natural gravity inlet was at the necessary height. On the whole, 4½ to 5 per cent. was a fair figure, and included the supply to the houses of the staff and the recreation rooms, etc. The water was measured by Lea recorders. As to the puncturing of insulators, it was so seldom that the line itself was struck by lighting that he did not think they had any records of any value on this point. With regard to earthed neutral, with the Metz-Price system, when the station cut off a faulty line, it did not interrupt the supply, as the latter was in duplicate; this was the great merit of the system, and it had been found extremely valuable. In regard to a question whether there were any other protective devices than the Merz Price system, there were also maximum overload cut outs provided, but they were screwed up so that they could not work. The general tendency was to make the machines bang on as long as possible, and only take them out of service if it was found really necessary. With regard to switches in sub stations, there were two sizes of switches smaller than in the power station, *i.e.*, three sizes of switches on the system; since the neutral was earthed, there had been considerably less trouble on the system. The transformers in the consumers' sub-stations were oil transformers, air cooled, but the transformers in the power stations and in the main central stations were water cooled. The compressed-air supply was far larger than anything tried elsewhere. They had never had a failure of the supply, but occasionally the pressure had gone down. The maximum pressure drop between the compressors and consumer was 6lb.

* * * *

Konomax Rock Drill Syndicate, Ltd.

The annual meeting of shareholders of the Konomax Rock Drill Syndicate, Ltd., was held this week in the board room of the Central Mining and Investment Corporation, Ltd., at Corner House. There were 11,315 shares represented out of an issued capital of £16,763. Mr. W. S. Thomas was in the chair, and in the course of his speech announced that there had been a loss for the year of £380 13s. The retiring directors, Messrs. P. C. Baerveldt and W. Mauss, were re-elected, and Mr. E. C. Lowe was elected auditor for the ensuing year.

With reference to the interesting description of the big electric winder at the Crown Mines, printed in our last issue, it should be mentioned that the mechanical portion of the work was supplied by Messrs. Fraser & Chalmers, Ltd., of the Corner House.

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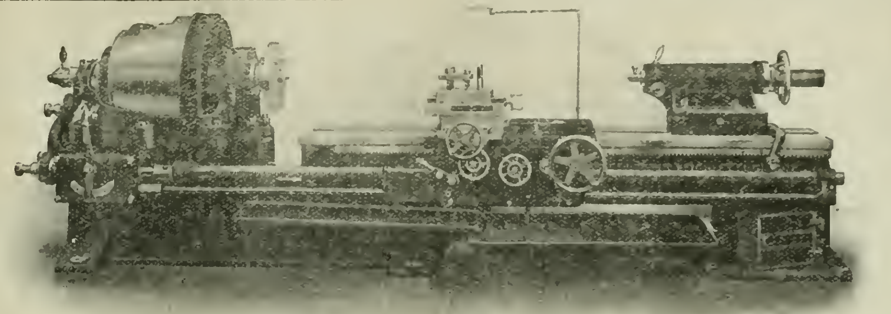

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Transvaal Gold Mining Estates, Ltd.

(INCORPORATED IN THE TRANSVAAL.)

Notice of Special General Meetings.

NOTICE IS HEREBY GIVEN that a Special General Meeting of Shareholders in Transvaal Gold Mining Estates, Limited, will be held in the Board Room, The Corner House, Commissioner Street, Johannesburg, on the 26th DAY OF AUGUST, 1913, at 11.15 in the forenoon, for the following purposes, namely:

(1) To consider and if thought fit to approve the draft new Articles of Association of the Company, which will be submitted to the Meeting, whereof document "A" embodies those provisions which would have been contained in the Memorandum of Association had the Company been formed under the Companies Act, 1909, Transvaal, and document "B" contains the provisions which would be found in like circumstances in the Articles of Association, and in the event of the approval thereof, without or without modifications

(2) To pass a resolution to the effect that the new Articles of Association contained in document "B" laid before this Meeting, and for the purpose of identification subscribed by the Chairman thereof, be, and the same are hereby approved, and that such Articles of Association be and the same are hereby adopted as the Articles of Association of the Company, to the exclusion of and in substitution for all the existing Articles of Association thereof, except those contained in document "A" laid before the Meeting, which would have been contained in a Memorandum of Association if the Company had been formed under the Companies Act, 1909, Transvaal, which shall remain unaffected.

Copies of the proposed new Articles of Association giving particulars of all alterations and additions will lie for inspection at the Head Office of the Company, The Corner House, Commissioner Street, Johannesburg, and at the London and Paris Offices of the Company, hereinafter mentioned, from the date of this Notice until the Meeting. A copy will be posted to the address of each registered Shareholder, and each holder of Share Warrants [illegible]

[illegible] those of the Company's Articles of Association which would have been contained in a Memorandum of Association if the Company had been formed under the Companies Act, 1909, Transvaal, and the clauses dealing with the constitution, objects and existing capital will now be embodied in the document marked "A," called the Memorandum of Association.

The Articles of Association have been remodelled and brought into line with modern practice, and contain clauses embodying the various powers and privileges conferred by the Companies Act, 1909, Transvaal, and other clauses based upon its provisions.

NOTICE IS ALSO GIVEN that a further Special General Meeting of Shareholders in the Company will be held in the Board Room, The Corner House, Commissioner Street, Johannesburg, on the 19th day of September, 1913, at 11.45 in the forenoon, for the purpose of receiving a report of the proceedings at the aforegoing Meeting, and, if thought fit, confirming the resolutions passed thereat as Special Resolutions in terms of the Companies Act, 1909, Transvaal.

The Share Register of the Company will be closed from the 26th day of August, 1913, to the 2nd day of September, 1913, both days inclusive.

Holders of Share Warrants wishing to be present or represented at either or both of the Meetings must deposit their Share Warrants (or may at their option produce same) at the places and within the times following:—

(a) At the Head Office of the Company, The Corner House, Johannesburg, at least twenty four hours before the time appointed for the holding of the first meeting.
(b) At the London Office of the Company, No. 1, London Wall Buildings, London, E.C., at least thirty days before the date appointed for the holding of the first meeting.
(c) At the Office of the Crédit Mobilier Francais, 30 and 32, Rue Taitbout, Paris, at least 30 days before the date appointed for the holding of the first meeting.

And must otherwise comply with the "Conditions as to the issue of Share Warrants or Bearer Shares" now in force.

Upon such production or deposit a certificate, with proxy form, will be issued, under which such Bearear Warrant holder may attend the meeting either in person or by proxy.

By Order of the Board.

TRANSVAAL CONSOLIDATED LAND & EXPLORATION
CO., LTD., Secretaries.
W. E. S. LEWIS, Secretary.

Head Office:
The Corner House,
Commissioner Street,
Johannesburg.
19th June, 1913.

A New Patent.

Mr. W. B. Craggs, of the Geduld Proprietary Mines, has recently patented certain improvements in or relating to the axle-boxes of trucks. The object is to provide an axle-box with a detachable half bushing or pad which can be readily renewed from time to time when worn, thus lengthening the life of the axle-boxes. The axle-box is constructed, in the usual manner, to completely enclose the axle between the bearings provided at opposite ends of the box. A suitably positioned aperture (or apertures) is provided in the box to permit of the introduction thereinto of oil or other suitable lubricant. The ends of the box are preferably constructed as usual to provide oil boxes or reservoirs in which lubricating pads serve for applying the lubricant to the axle. The half-bushings or pads are located in the ends of the box above the oil-boxes or reservoirs. The said half-bushings or pads are of hollow substantially hemi-cylindrical shape—they may be made thicker at the top than at the sides—and along the edges they are provided with external ribs, projections or flanges which may be either continuous or intermittent. The box is constructed at the sides with correspondingly shaped grooves or recesses to accommodate said ribs or projections when the bushing or pad is in position, and the sides of the box beneath said grooves or recesses are preferably thickened somewhat or extended inwardly for a distance equal to the length of the bushing or pad, more or less. The half-bushings or pads may be retained in position in the axle-box and prevented from moving longitudinally the axle by suitable means. The axle-box may be constructed with projecting parts or recesses in which the ordinary straps may be placed for fixing the box to the underframe or carriage of the truck; or the axle-box may be fixed to the truck by any other preferred means.

South African Mining Journal

REMOVAL OF OFFICES.

The Offices of the South African Mining Journal are now situated at Nos. 176 to 180, STOCK EXCHANGE BUILDINGS, Fox Street, Johannesburg—(2nd Floor).

QUARTERLY REPORTS.

May Consolidated.

The report for the three months ended the 31st of March of operations at the May Consolidated shows that from 43,590 tons milled the revenue recovered was £45,204, or 20s. 8·886d. per ton milled. Working expenses absorbed £33,163, or 15s. 2·589d. per ton, which left a working profit for the quarter of £12,041, or 5s. 6·297d. per ton. Sundry revenue brought in £186, and £450 was the estimated amount to be received from interest, making a total of £12,678.

Van Ryn Gold Mines.

Revenue £163,099 13s. 4d., or 28s. 1·44d. per ton from 116,000 tons milled; cost £90,250 5s. 10d., or 15s. 6·72d. per ton; profit £72,849 7s. 6d., or 12s. 6·72d. per ton; capital expenditure, £3,750 5s. 6d. The working profit is approximately the same as for the previous quarter. Eight new rooms have been added to the compound during the quarter under review. The construction work in connection with the new assay office and smelting house will be completed in the course of the current month.

Randfontein Central.

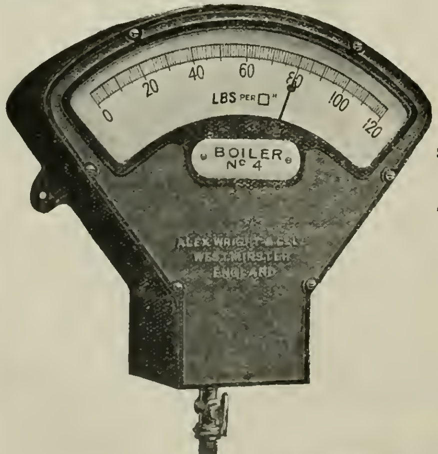
The report for the three months ended the 31st March on operations at the Randfontein Central states that from 669,616 tons milled 189,426.875 ozs. of gold were recovered. The statement of expenditure and revenue shows that, including £54 from general revenue, the receipts were £795,292, equal to 23s. 9.04d. per ton milled. Total working costs were £556,793, or 16s. 7.56d. per ton, which left a profit of £238,498, or 1s. 1.48d. per ton. Capital expenditure amounted to £56,886. On development work 22,896 linear feet were driven, risen and sunk, and 136,494 cubic feet taken out. The ore reserves at the 31st March were 669,616 tons. The supply of native labour is sufficient for requirements.

St. John Ambulance Association and Brigade.

The Annual service will be held at St. Mary's Church, Plein Street, Johannesburg, at 11 a.m., To-morrow, Sunday, the 22nd June, 1913, and all First Aiders, and Members of the Brigade, are cordially invited to attend.

Situations Vacant.

Wanted, certificated Mine Surveyor for Collieries.—Apply, stating age, experience and salary required, with copies of recent testimonials, to "X," Central News Agency, Vereeniging.



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Finance, Commerce, and Industries.

New Rand Water Works.

At the meeting of the Rand Water Board last week, Mr. H. O'K. Webber, as vice-chairman of the Finance and General Purposes Committee, moved the adoption of the report and accounts. He said, *inter alia*:—In order to save time, the Board's legal advisers have been instructed to draft in outline the fresh regulation, which will be necessary, and I am informed that this work is now nearing completion. In terms of the Standing Orders of Parliament it will be necessary to give public notice in the months of October or November next of the Board's intention to introduce a Bill at the session of the Union Parliament which, presumably, will commence early next year. If this Bill is approved by the House by about April or May, 1914, as no doubt it will, the Chief Engineer will be able to commence work on the new scheme a month or two later. The engineer tells us that a period of 3 to 3½ years must elapse from the date on which work is commenced before a first instalment of the new supplies can be brought into service, and that the whole scheme will be completed a year later. Thereafter the water troubles which have in recent years occasioned so much anxiety and inconvenience to the various communities on the Rand will be at an end." The report and accounts were adopted.

* * * *

Landing and Forwarding.

During the sittings of the Select Committee of Union Railways and Harbours feeling appears at times to have run high, the favourite bone of contention being the proposition that the Government, through the Railway Administration, take over the business of the forwarding agents at Durban. The witnesses connected with the Administration were strongly of opinion that the work should be taken over by the Government, and, in reply to the contention that the change would involve the displacing of a large number of employees, stated that the work would have to be done and that the majority of the hands now employed would be continued in their employment under the Government. On the other hand, the witnesses connected with the trade were vehement in their denunciations. Senator C. Hitchens, on behalf of the African Boating Co., of which he was the founder, was particularly emphatic. *Inter alia*, he said that the company handled 790,000 tons out of a total of 1,226,000 handled at Durban, and their contracts stipulated for landing at any hour of the day or night, including Sundays and holidays. The contract price was 2s. 3d. per ton. The witness did not think that similar expedition would obtain under the proposed control, and added: "You will not get the General Manager of Railways to work on Sunday, and you will not get him to sit up till two in the morning to see things going all right when discharging at night." In reply to the suggestion that the thing had been successfully attempted at Capetown, the Senator replied: "If the Committee could see the work done at this port they would tell you that it is impossible for the Railway to do it. It cost them £250,000 at the Cape to get it into working order since the purchase, and they gave £300,000 for compensation, and nothing is straight yet. Further, the witness said the Bill made an attempt to interfere with private rights that Parliament should protect, and if carried would deprive hundreds of men of their livelihood. It ignored the express wish of the commercial and shipping community in Natal, and attempted to wipe out private interests altogether." Finally, the witness said: "You asked a witness yesterday whether he would undertake to control the whole of the shipping at the Point if he had the contract. I say there is not a man born who could do it, any more than you could ask a shipping man to go in and take charge of the Railway management. Are you going to override the laws of the land? I just wish to say here that this is an attempt to take away the whole of that business and not give any compensation." Reverting to Capetown, the witness said: "You might just as well compare the Chinese Parliament with the Imperial House Parliament as to compare Durban with Capetown." In a concluding plea for the men at present employees of the company, the Senator said that as a taxpayer he objected to the whole proposal, but on behalf of the company he only asked for compensation. His company had four pensioners at present and a compensation fund of £27,000. His anxiety was for the men who had been working with them for very many years. There were thirty or forty of them and he feared they would not be taken on under the new scheme. He hoped that if compensation was given these men would be personally considered.

* * * *

The Stamp Duties.

Before dissolving, the House of Assembly passed the second reading of the Stamp Duties and Fees Amendment Bill. At present Union Stock pays no duty on issue, but pays a duty on transfer. Municipal Stock within the Union pays both on issue and on transfer. The Amendment Bill abolishes the duty in all three cases. The justification for the change is simply that a country which is constantly in need of capital from Great Britain, stands in its own light by imposing stamp duties which tax either the issue or the transfer of either National or Municipal Stock. Duties of this kind are all very well in a creditor country like England: they are merely harmful in a borrowing country like South Africa. Mr. Hull, when at the Treasury, was apt to ignore the distinction, and some of his taxation proposals excited a great deal of resentment in financial circles in London. The abandonment of these proposals, and the amendment of the stamp duties in the direction we have mentioned, are indications of a more politic and prudent attitude at the Treasury. The Bill also does away with the stamp required under the Stamp Duties and Fees Act of 1911 upon all brokers' notes "where the consideration does not exceed £25." Under the Act commercial brokers are entitled by law to recover the duty from their principals: but, as the Minister of Finance acknowledged in reply to a question put in the House by Mr. Nathan some months ago, the inconvenience to which brokers are put, in order to carry out the provisions of the law, is out of all proportion to the value of the small parcels of commodities which they are frequently called upon to handle.

Swaziland Tin, Limited.

(INCORPORATED IN THE TRANSVAAL.)

Dividend No. 13.

NOTICE IS HEREBY GIVEN that an interim dividend, No. 13, of 20 per cent. (4s. per share) has been declared by the Board, payable to all Shareholders registered in the books of the Company at the close of business on the 30th June, 1913.

The Share Transfer Books will be closed from the 1st day of July, 1913, to the 7th day of July, 1913, both days inclusive.

The Dividend Warrants will be posted to Shareholders from the Head Transfer Office on or about the 5th August, 1913.

By Order of the Board.
TRANSVAAL CONSOLIDATED LAND & EXPLORATION CO., LTD., Secretaries.
W. E. S. LEWIS,
Secretary.

Head Office:
The Corner House,
Johannesburg,
20th June, 1913.

RHODESIA GOLD MINING AND INVESTMENT COMPANY.

Mr. Drake's Annual Report—The Lonely Reef Interest—Bernheim and Felixburg Claims.

THERE has just been issued the report of the consulting engineer of the Rhodesia Gold Mining and Investment Corporation for the year ending December 31st, 1912, signed by Mr. Francis Drake, which records a period of activity and progress of which that concern may feel well satisfied. The work done by the Bulawayo office during the year has consisted of supervising operations on properties, the predominant interest in which is owned by the Rhodesia Gold Mining and Investment Co., Ltd., viz., Lonely Reef, Sabi, Bernheim, Felixburg and Pretty Polly Mines. In addition, the examination of properties offered for sale has received the attention of the staff. The principal interest of the company is the Lonely Reef, in which the Rhodesia Gold Mining and Investment Company has a large interest and to the management of which a large proportion of the work done in the Bulawayo office is devoted. Mr. Drake states:—

Operations have proceeded throughout the year in an energetic manner, but were hampered to some extent during November and December by a shortage of water owing to the most unusual character of the season. Good rains have now fallen, and I am sanguine that no such trouble will be experienced in the future. The developments in the mine have been entirely satisfactory, as no alteration has taken place in the characteristics of the vein at the lowest point in the mine. The ore reserves at the end of the year stood at 171,529 tons, of an assay value of 22.4 dwts. gold to the ton. At the end of 1911 the ore reserves amounted to 140,344 tons, of an assay value of 22.65 dwts gold per ton. It will be seen that the quantity has been increased by 31,185 tons, and the assay value reduced by .25 dwt. per ton. The ore crushed during the year amounted to 37,655 tons. This, together with 6,331 tons of old slime, was treated for a total yield of £160,179 1s. 2d. An additional tube mill has been installed, and, further, five stamps are to be put in during the next few weeks. With this increase to our crushing capacity, providing nothing unforeseen occurs, we should mill 50,000 tons during the current year.

SABI GOLD MINE.

You have a large shareholding in this property. It is situated in the Belingwe district about sixty miles south of Selukwe. Work was carried on during the first half of the year in the Sabi Mine itself and on the property of The White Sabi Gold Mining Company, and the Northern Claims. In June you were advised that the development work should be more energetically carried on or the work should be suspended temporarily. You decided on the latter course. Since that time the only work done has been to maintain the plant in good order and keep the water below the No. 6 level, which is done by hoisting in buckets twice a week. The work done in Sabi Mine was below the No. 5 level with, on the whole, favourable results: the ore developed in this section and on the dump being increased to a little over 19,000 tons, the average assay of which is 10.36 dwts. per ton. The ore occurs in lenses which frequently overlap, and I have no doubt that stoping will disclose ore which has not been taken into account in the foregoing figure. When work is resumed the ore reserves will be more rapidly added to than in the past, as several cross-cuts have been completed disclosing the vein in their ends. At the deepest point in the mine a cross-cut shows a well defined vein, a sample from which gave 5.8 dwts. per ton over a width of 46.5 inches. This assay, although not up to the average, must be looked upon as a very favourable indication. Judging from results obtained in the past, driving on a vein of this width will disclose ore of a higher grade. The work done on the White Sabi has disclosed a total of nearly 3,300 tons, the average assay of which is 8.85 dwts. gold per ton. This quantity can also be quickly increased when work is resumed. On the Northern Claims encouraging results were obtained at one point, and this will be further developed during the coming year, when the annual inspection work has been done.

BERNHEIM MINES

In this property you hold a nine-tenths interest. It is situated in the Mazoe district about 25 miles from Salisbury. The area held at the beginning of 1912 consisted of 38 blocks of claims, most of which are of full size. During the year seven blocks were pegged, as they possibly contain extensions of the veins showing in the original blocks. The total area now held amounts to 45 blocks containing 441 claims. During the year work has been carried on continuously, but with the exception of the small quantity done on the Mt. Moriah blocks, it has been confined to the southern end of the property. Details of the work done are shown in the following tabulation

Working Place	Drifts ft.	Cross cuts ft.	Shafts Winzes & Rises ft.	Miscellaneous. ft.	Totals ft.
Rothschild Parallel	647	15	321	61	1,050
Rothschild West Ext	319	34	233	—	586
Vesuvius Blocks ..	217	31	14	-	262
Mt. Moriah Blocks		10	28		68
	1,183	120	599	61	1,966

Rothschild Parallel Section.—The main hoisting shaft has been sunk to a total depth of 605 feet, having been deepened 162 feet during the year. The upper portion of the shaft is in "worked out" ground, and gave some trouble in the early part of the year, but with care it will answer to do development work from, to a considerable further depth. The shaft followed the vein fissure to a depth of 580 feet, and some vein matter carrying profitable ore was encountered. At 580 feet the vein became steeper and the bottom of the shaft is in the hanging wall. Two levels were opened from the shaft, the No. 5 at 480 feet and the No. 6 at 605 feet.

The ore developed by the work done to the end of 1912 in various sections of the property has amounted to 12,711 tons of an assay value of 10·8 dwts. per ton. On the Felixburg claims, situated about 25 miles from Umvuma, work was carried out on the Pick Up, Helpmakaar and Sunbeam claims. Of the latter, Mr. Drake writes that "the work done and the prospects warrant further development below the 100 ft. level, the results of which I believe will warrant the erection of a small ore reduction plant." As to the Pretty Polly, Mr. Drake writes: During the year, 6,073 tons were milled for a total yield of £10,798 19s. 9d., giving a working profit of £2,121 3s. 8d. The yield from amalgamation was 24·44s. per ton, and from cyanidation 11·12s. per ton, a total of 35·56s. per ton. The working cost amounted to 28·57s. per ton, leaving a working profit of 6·98s. per ton. In the absence of a slime treatment plant the recovery has been entirely satisfactory. During the year 2,100 tons of slime have been produced, the average assay of which is 4 dwts. to the ton. This was led to a storage dam. Possibly a small plant may be devised to treat it at a profit, the quantity being so small, however, there will not be much if any profit in doing this. The present outlook is that operations can be carried on until the end of March, possibly a few weeks longer. If the development in No. 6 does not prove a longer ore shoot than is indicated at present we can only clean out all the available ore and close the mine down.

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Automobile Notes.

Road Motor Transport.

In the House of Assembly on 13th May, Mr. H. M. Meyler (Weenen) asked the Minister of Railways and Harbours: (1) What is the estimated cost per mile of instituting and operating a road motor transport service for passenger and goods traffic as specified in the Report of the General Manager of Railways for 1911, with particulars as to cost of (a) preparing the necessary roads, (b) supplying the vehicles, (c) the equipment of the service, and (d) maintaining same; and (2) what has been the actual average cost per mile of the road motor transport services at present in existence in the Union? The Minister of Railways and Harbours replied: (1) Estimated cost per mile of instituting a road motor transport service for passenger and goods traffic: Where good roads are in existence, £250 per mile; where first-class metalled roads have to be constructed, £1,450 per mile; where second-class roads have to be constructed, £900. Estimated average operating costs: Passenger service, 1s. 7d. per car mile; goods service, 6d. per ton mile. (a) Estimated cost of preparing necessary roads: First-class metalled road with maximum grade of 1 in 15, £1,200 per mile; second-class road made from local gravel or road metal with maximum grade of 1 in 12, or existing veld road graded and hardened, £650 per mile. (b) Estimated cost of vehicles: First-class passenger vehicle, to carry passengers, mails, and parcels, £1,100 per vehicle; 3-ton baggage or goods lorry, £825; paraffin tractor with trailers carrying 12 ton load, £1,600. (c) Estimated cost of buildings, plant, machinery and tools, exclusive of vehicles: 20 mile service, £680; 30 mile service, £1,100; 40 mile service, £1,500. (d) Estimated cost of maintaining roads, plant, and equipment: Roads, £30 per mile per annum; vehicles (including depreciation), 9d. per car mile; equipment, 7½ per cent. per annum on original cost. (2) Average actual cost of existing services, including depreciation, 1s. 7·7d. per car mile.

* * * *

The great Commercial Motor Vehicle Exhibition, which has been organised by the Society of Motor Manufacturers and Traders, Limited, and which is to be held at Olympia, London, England, from July 18th to July 26th, promises to meet with an overwhelming success, and it is not surprising that the Exhibition has not only aroused enthusiasm in England, but has excited general interest and favourable comment abroad. The great aim of the organisers has been to make the exhibition of an entirely international character, and fully recognising the fact that the question of transport is one of supreme importance in the Colonies, many of the exhibitors have set themselves out to produce specially constructed motor vehicles for rough colonial work. The exhibits will include vehicles for the farmer; for the man "up-country"; for heavy transport work; for light delivery dispatch work; vehicles for municipal purposes, such as watercarts, fire-engines, ambulances, vehicles for mail service; motors which will run on paraffin and benzole alcohol, as well as petrol. Business men would do well to try and make arrangements for their visits to England to synchronize with the opening of the July Exhibition, for this great international show will prove one of the most remarkable evidences of the growth of automobilism as applied to industrialism and commerce and its adaptability to every kind of transport work.

* * * *

The prospectus of the Transvaal Oil Shale Syndicate was issued less than a year ago, but the circular just published by the Directors shows that already a considerable part of the expectations indulged in must be largely discounted, says the London *Financial Times*. Great stress was laid on the promise of the Mooifontein property, and it was stated that "the leading expert on oil shales and oil shale possibilities in South Africa" considered that prospects there promised a "splendid return." Now we are told that the directors much regret that developments on the property have failed to prove that the deeper seams of shale contain oil in payable quantities. The top seam, it is asserted, has been proved payable, but this in itself is not sufficient to warrant the erection of any plant.

* * * *

Some figures in connection with what is called the "American Invasion," appeared in a recent issue of one of the leading American automobile journals. From a study of these, it is evident that the imports of motor cars from that country into England is on the wane. For the eight months ended February last there was, in comparison with the corresponding period last year, a decrease of one-third, equal to $1,300,000 in value. The Americans ascribe this falling off to the antagonism of the trade and the buying public to the "invasion," but while this must be regarded as a factor in the matter it is only a partial explanation of

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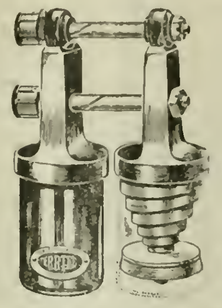

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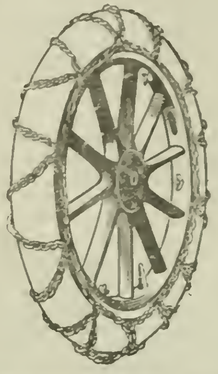

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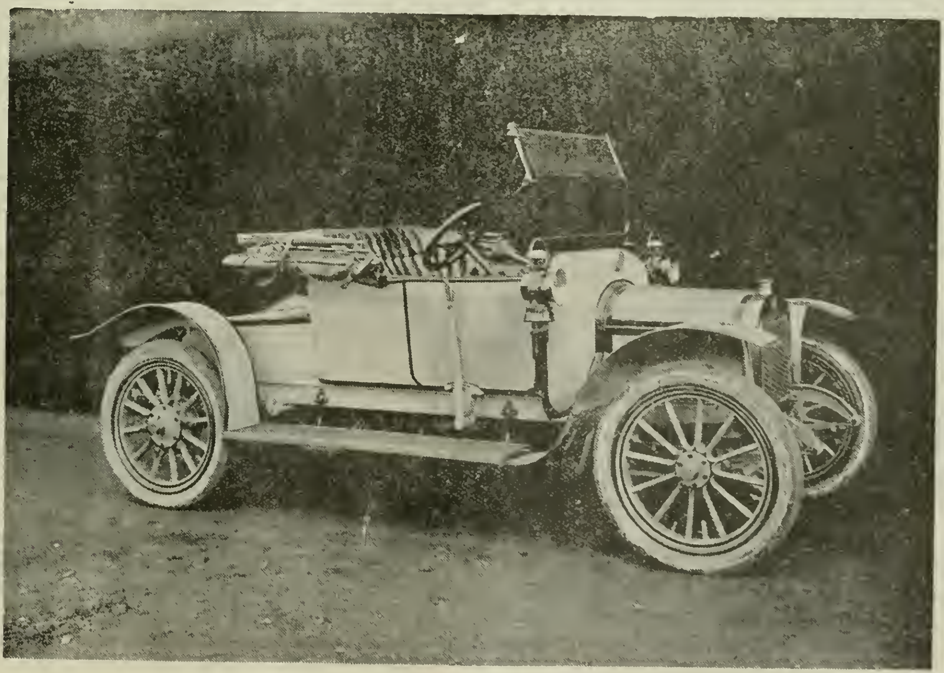

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the fact. There can be no doubt that the British manufacturer has learnt, through the invasion, the value of the large market to which the American manufacturer appealed, and has entered into successful competition. A number of small cars, such as are listed by the Standard, Singer and Humber companies, fulfilling the requirements of this market, and considerably superior in efficiency and finish to the imported article, have been produced at prices only slightly in advance of the cheapest foreign production. The influence of the cycle car, too, has been an important force in this contest, and within the last two years this link between the motor cycle and the motor car has developed into a type of miniature car, which is certain to attain a high degree of popularity. The next two years will see many well-finished small cars of low power, capable of performing much the same work that to-day is done by more pretentious favourites, turned out at a price that will effectually dispose of outside competition.

* * * *

A new style of gearless differential has been brought out by a Detroit inventor, differing entirely from any other hitherto introduced. Gears, springs and friction drives are all eliminated, and great claims are made for it. The principle of the device is an adaptation of the well-known ratchet and pawl mechanism, in which the place of the former is taken by gravity alone, and the place of the latter by small cylindrical pins free to move within peculiarly shaped slots. When driving along a straight road, the pawl-cams lock and transmit the power equally to both wheels. When a curve is reached, the outer wheels overruns its pawl-cams and the inner wheels skids, the pawl-cams on that side are released, and the drive is taken automatically by the other wheel, differing in this respect from the ordinary differential, which, under similar conditions, would continue to expend the power uselessly on the slipping, and, for the time being, non-working wheel. It is too early to say whether the device is likely to fulfil the expectations of the inventor. It is, however, now being tested on a heavy commercial vehicle, and its future will largely depend upon the results obtained in the trial.

* * * *

The Organising Council of the London Road Congress have decided to offer prizes to the value of £35 for the best designs of direction posts and plates submitted. Competitors may submit drawings or models, and a full detailed memorandum must accompany these, giving information upon points such as material, shape, size, colouring, lettering, estimated cost, method of erection and adjustment, estimated cost of maintenance, etc. Suggestions are required as to the suitability of various districts and conditions, sound mechanical construction, simplicity of erection, visibility at sufficient distance, etc. The total number of prizes is not to exceed three.

* * * *

In an interesting article on "Petrol and Alcohol as Fuel for the Internal Combustion Engine," *Engineering* considers that the merits of the latter are well worth inquiring into. While the heating value of alcohol is not more than 0·6 per unit of that of petrol, it requires only half the weigh of air for its complete combustion. But the heating value of equal volumes of explosive mixture of either petrol or alcohol, mixed with sufficient air for complete combustion, is the same—about 80 British Thermal units per cubic foot. Again, petrol can only be compressed to 70 lbs. per square inch in a 15 h.p. 4-cycle engine, while the alcohol mixture stands, under the same conditions, 180 lbs. per square inch, without danger of pre-ignition, and these maximum pressures are, on the whole, the most economical as to fuel consumption. Types of engine designed for the one fuel are within limits adaptable to the other. Alcohol fired in a petrol engine at 70 lbs. pressure will yield 10 per cent. more power than petrol; at 180 even 30 per cent.

Crown Mines, Ltd.

The following is the report on operations at the Crown Mines for the quarter ended 31st March:—Balance of working expenditure and revenue account, £352.056. Number of feet driven, sunk and risen, exclusive of stopes, 11.764. The reef disclosures were as follows:—Main Reef Leader: Distance exposed, 3,100 ft.; width, 25 ins.; assay value, 53s. 10d. South Reef: Distance exposed, 2.010: width 29 inches; assay value, 51s 11d. Ore received from mine, 646.394 tons; waste sorted out, 12.9 per cent.; tonnage crushed, 561,000 tons; number of stamps operating, 660: number of tube mills operating, 25. Mill yield per ton, 21s. 9d.; assay value of pulp, 9s. 11d.; total, 31s. 8d. Total yield, 204.060 ozs. fine; total yield per ton, 30s. 7d. The tonnage crushed amounted to 561.000 tons, an increase as compared with the previous quarter of 54.200 tons, and the largest tonnage so far treated by the amalgamated properties. The working profit at £376.588 is also satisfactory and is an increase of over £38.000. The expenditure on development and equipment during the quarter amounted to £13 602. An amount of £111.330 remains unspent in respect of authorised capital expenditure. The native labour force at the end of the quarter was 15.291, as compared with 13,051 at the end of December, 1912. The seventeenth ordinary general meeting of shaerholders will be held in the board room, The Corner House, Johannesburg, on Friday, 6th June, 1913, at 3 p.m.

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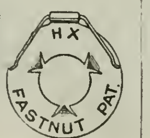

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Notes and News.

Modder Deeps.

At the Modder Deep Levels an inflow of water was encountered last week which must necessarily hamper operations somewhat for a time. The influx is not, however, serious, and the water is well in hand. Development both at this property and at Geduld is proceeding most satisfactorily.

* * * *

Roberts Victor.

We are informed that the Roberts Victor Diamonds, Ltd., has acquired full prospecting rights over the remainder of the farm Damplaats, that is to say, over and above the area on which the present Roberts Victor diamond mine is situated. It is the intention of the board of directors to commence prospecting operations at once with a view to the discovery of a further mine or mines on the farm.

* * * *

Tin and Copper Figures.

Whilst the sales and shipments of tin in the Transvaal last month were 269·8 tons as compared with 243·2 tons in April, the value at £34,060 was slightly less. This, of course, is due to fluctuation in the price realised for the metal. The Cape's production was 7 tons, of a value of £985. In regard to copper, sales and shipments from the Transvaal were only 180 tons of 42 per cent. value, worth £4,402. The actual production was, however, 333 tons of 50 per cent. value. The Cape recorded an output of 913 tons of 46 per cent. metal, but no ore was sold or shipped during the month.

* * * *

The Lonrho Co.'s Operations.

The London and Rhodesian Mining and Land Company continues its activities in Rhodesia—principally in Mashonaland. The Cam and Motor continues to engross the greater part of the company's attention, but other interests are being continually examined and taken up. One of the most important developments in connection with the Lonrho Company's affairs of late has been the granting of a three years' tributary option over the well-known Botha Reef property in the Kimberley Reefs district. This company has, too, optioned the Linnith claims in the Lomagundi district. At both mines the tributors are erecting batteries. As to the Cam and Motor, it may be remarked that the ore reserves are now estimated to contain an aggregate value of £2,262,150.

* * * *

The Pilgrims Rest Area.

We learn that considerable attention is being directed, both locally and in London, to the Pilgrims Rest mining field and that an influential English syndicate is engaged in spying out the land there and has had a representative selecting claims. The Transvaal Gold Mining Estates Company has for some years past qualified for inclusion in the list of the world's leading productive gold mines, and both this property and the Glynn's Lydenburg have been steady and large dividend payers. The profitable results secured by the Rietfontein Mine, the Ceylon Lydenburg, and other smaller propositions have, too, been consistently good, and were it not for the overwhelming predominance of the Witwatersrand this area would, without doubt, attract more attention than it does at present. There are probably, indeed, few gold fields in the world which possess such highly attractive possibilities as this portion of the North-Eastern Transvaal.

* * * *

Coal Outputs in May.

There was a considerable increase in the amount of coal sold in the Union of South Africa last month as compared with the April amounts. In the four Provinces 784,549 tons, valued at £196,488 at pit's mouth, were sold, as compared with 763,620 tons, valued at

£191,513, in April. As usual the greater part of this was derived from the Transvaal, where 457,063 tons sold for £98,813—4s. 3·89d. per ton. There were in the Transvaal 30 collieries producing, and of these 16 were situated in the Middelburg area, where 344,242 tons were sold for £73,992. In the Cape Colony 9 collieries were at work. These raised 6,104 tons of coal, which sold for £3,255—10s. 7·98d. per ton. The Orange Free State pits raised 53,849 tons, which realised £15,025, whilst the collieries of Natal accounted for a production of 267,533 tons, or £79,395—5s. 11·22d. per ton. It may be remarked that the selling price of Transvaal coal at pit's mouth was only 4s. 3·89d. per ton. Were it not for the sound business management obtaining at the larger Transvaal collieries and the presence of a coal owners' combine or association, the Transvaal coal trade, in face of the well-nigh insane competition obtaining, would seemingly be an almost unprofitable branch of industry.

* * * *

Barnato Group Dividends.

The dividends declared this week by the subsidiaries of the Johannesburg Consolidated Investment Company reflect the steady improvement in profit that has characterised the monthly operations of mines under Barnato control for a considerable time past. Comparing these declarations with those announced a year ago, it is most satisfactory to note that the New Unified is the only member of the four declaring companies that has not improved on its January-June, 1912, distribution. This company maintains, however, a ten per cent. payment to shareholders, which must be adjudged thoroughly satisfactory, especially as this company a few years ago was popularly adjudged to be a practically unpayable concern. The Ginsberg pays out £36,750 as compared with £31,500, and the New Primrose £97,500 as against £81,250. The largest advance in amount falls to the credit of the Witwatersrand or "Knights" mine. The declaration by this company is of 25 per cent. as against 17½ per cent. in June of last year. Moreover, the capital is larger, £469,625 as against £425,000, and the net result in cash aggregate is £117,406 as compared with £74,375. Dividend prospects of this group for the end of the year are undeniably good, the more so inasmuch as the Consolidated Langlaagte may be expected to enter the dividend list before the end of 1913.

* * * *

Development and Rock Drills.

The development carried out in Witwatersrand mines last month amounted to 47,067 feet in respect of main drives and crosscuts, 2,856 feet on main shaft sinking, and 29,403 feet for other development. For the whole Transvaal the totals are, main drives and crosscuts 56,075 feet, main shaft sinking 3,259 feet, and other development 30,997 feet. These compare with 56,486 feet, 3,256 feet, and 30,356 feet respectively in the previous month. The number of rock drills at work was 6,128 as compared with 6,190 in April.

* * * *

Native Deposits and Remittances.

In the course of his report for 1912, the Director of Native Labour says that a considerable increase in the use made by natives of the Deposit and Remittance Agency of the Native Labour Department has to be recorded as is reflected in the following comparative figures:—Deposits, 1911, £22,961 15s. 3d.; 1912, £31,105 14s. 5d. Remittances, 1911, £25,560 15s. 2d.; 1912, £41,561 0s. 10d. Totals, 1911, £48,522 10s. 5d.; 1912, £72,666 15s. 3d. It will be seen that the amount in respect of which transactions were effected was £24,144 4s. 10d. in excess of that for the previous year. The practice of charging fees for the remittance of monies by natives was discontinued in January, 1912, as it acted as a deterrent to natives making use of the Agency, and the revenue derived from this source was inappreciable. An amount of £7,500 representing a credit of the Agency is in the hands of the Public Debt Commissioners for investment. The Director adds:—"A practice inaugurated by the Eckstein's Labour Department and other group labour organisations of remitting monies free of charge on behalf of their native employees was continued by the Native Recruiting Corporation. The system has grown in favour and this convenient method of remitting money to their homes is now widely used by natives, upwards of £16,000 being remitted in this manner during the year. Returns of the amounts remitted are rendered monthly to this office, and I am gratified to be able to report that no instances have come to my notice where monies remitted have miscarried or where the system has been abused."

* * * *

De Beers' Dividend.

The directors of De Beers have declared a dividend of 15s. per share for the half-year ending June 30, 1913, and a bonus of 5s. per share for the financial year ending the same period to the deferred shareholders registered on that date. They have also declared a dividend of 10s. per share to the preference shareholders for the half-year ending June 30.

* * * *

The Sub Nigel and Durban Roodepoort Dividends.

The Sub Nigel Company has just declared its second dividend—one of 2½ per cent., or 6d. per share—for the six months ending June 30, 1913. The amount involved is £10,789 10s. and this dividend is payable on August 14th to shareholders registered in the books of the company on June 30th, 1913. The first dividend—one of 5 per cent.—was, it may be recalled, declared in December last. Another dividend is that of the Durban Roodepoort. This fine old mine, which has been one of the most consistent and substantial dividend payers on the Witwatersrand, has just announced its seventy-eighth distribution—one of 10 per cent. and absorbing the sum of £12,500. From May, 1889, to February, 1909, inclusive, 63 dividends aggregating £1,135,083 were distributed. Since the latter date the company has distributed a further 185 per cent. amongst its shareholders.

* * * *

Pniel Reconstruction.

With a view to providing more working capital to carry on operations more effectively and successfully, a scheme of reconstruction has been proposed by the principal shareholders of the Pniel Company, and has met with the approval of the directors, who are satisfied that the scheme is an advantageous one for the company's shareholders, to whom it should furnish a reasonable expectation of dividends in the near future. The scheme (which will be fully explained at a special meeting) necessitates, amongst other things, certain liquidation resolutions and an agreement, which provides in effect (amongst other things) for the sale and transfer to Pniels, Limited, of the undertaking, rights, concessions, assets and liabilities of the company, who will receive in exchange 60,000 shares of £1 each in Pniels, Ltd., credited as fully paid for distribution among the present shareholders in accordance with their rights and interests in the company.

* * * *

Rhodesia's Mineral Output to Date.

As a tribute to the mineral wealth of Southern Rhodesia, it may be remarked that the grand total value of mineral production for that territory up to the end of December, 1912, has been £23,830,093. Of this, gold accounts for by far the greater aggregate—no less than £22,378,697—with coal next at £603,227. In regard to the production of precious metal it should be noted that 14,421,176 short tons have been treated for a total output of 5,713,416 ozs., equivalent to a recovery of 31s. ·03d. per ton. The revenue per ton milled last year was 35·2s., the highest recorded since 1903. Indeed, the grade of the Southern Rhodesian mines considered as a whole has been steadily rising since 1907, due no doubt in large measure to the improvement in the returns of the Globe and Phœnix mine. Next to gold and coal, chrome iron occupies pride of place on the list with a total of 216,268 tons of a value of just on half a million sterling. Then comes silver with a million and a half ounces, worth £173,665, next lead, and then diamonds.

Tropical Natives. At the meeting of the Chamber of Mines on Thursday, Mr. John Munro, the President, gave the history of the recent negotiations in regard to tropical natives. He said: The Director of Native Labour, who has always evinced the keenest interest in the question of mortality among tropical natives, arranged an interview with the Minister for Native Affairs, and a deputation went to Capetown to place their proposals before him. After hearing the deputation, the Minister stated that he would announce the decision arrived at by the Government in the House at an early date. On the 8th of May the Minister stated that the Government had decided to prohibit further recruiting in tropical areas. We are satisfied that substantial reduction in mortality would have been effected had our recommendations been adopted, but we must acknowledge that the decision arrived at by the Government was a just one. When making the announcement the Minister quoted the mortality figures for the years 1910, 1911, and 1912, which, though showing a progressive reduction in the death-rate, discloses the fact that it still remains exceedingly high. We maintain, however, that the basing of an annual death-rate on the mortality of the W.N.L.A. compound in any one month is, as has been repeatedly pointed out, most misleading, and deductions from such figures cannot give a true reflection of the position. It is further to be remembered that no proper comparison between the death-rate of a population exposed to unusual conditions, such as the tropical natives are exposed to when passing through the W.N.L.A. compound, and the death-rate of any population under ordinary conditions is possible.

* * * *

A New Dust-Allaying Device. A new and interesting invention, styled the "Conuing's Atmospheric Purifier" is about to be placed on the local market. The patentee claims for it that it will eliminate phthisis from the mines. It is an automatic machine and consists of a cylindrical metal drum, into which pure water is fed from any pipe in the mine. Power for distributing and spraying this water is derived from the compressor which drives the drills. On the top of the drum there are two adjustable nozzles which can direct the water in any direction desired. The difficulty hitherto has been to deal with dust during the period of blasting, when the dust evil is greatest. It is claimed that this invention gets over this difficulty, in that it can be operated from surface. The inventor claims that when the two nozzles are turned on the atmosphere is vaporised into a Scotch mist, "thereby expanding the air" after blasting. The dust mixes with the vaporised atmosphere and the dust particles, it is declared, will be brought down to the floor of the mine, and on the contraction of the air the noxious fumes will be forced up the shaft. Further, that by the time the men come on shift again they will find an atmosphere free of dust and humidity. During drilling operations the machine can be used either as a spray or jet which will not affect the workers, but allay the dust. The machine is small and can be carried from place to place by a single native. It is simple in construction, takes no handling, and can be sold to mines at a very moderate price. We understand that one or two local medical men interested in the phthisis question have expressed high appreciation of the device.

* * * *

Van Ryn Deep Mill Starts. The new 80 stamp and tube mills plant of the Van Ryn Deep was started up on Thursday. The operation is, of course, purely in the nature of a trial run and is undertaken with a view merely to test the equipment and, so to speak, to tune it up rather than with a view to the recovery of gold. The plant, which must be accounted the most modern on the Rand, has been fully described in previous issues of this journal, and we will here therefore merely content ourselves with saying that a high stamp duty and generally excellent results are confidently expected of it. At a time when the Further East Witwatersrand is under something of a cloud on account of the insensate miners' strike, the announcement that a new mill has commenced crushing operations there should have a distinctly brightening effect.

TOPICS OF THE WEEK.

THE STRIKE.

ANOTHER week has almost passed, and the strike at the New Kleinfontein, Van Ryn and New Modder continues. Since our last issue, many of the New Modder employees have come out, though the mine has enough men available to keep operations going. The New Kleinfontein mill is gradually getting back into its stride, and every day the mines affected seem to be regaining the lost ground. The possibility of a general strike has clearly grown more remote, as the men realize that there is no general grievance to strike about. Even the strikers seem to have come to see the hopelessness of the struggle and their resentment towards their leaders is not less noticeable than towards the growing body of strike-breakers. At the moment of writing there is good reason to suppose that the whole trouble will be at an end by the middle of next week, and a "sauve qui peut" may result. Interesting references were made to the quarrel by the President of the Chamber of Mines and Mr. Schumacher at the meeting of that body on Thursday. Mr Munro, the President, described it as hanging "like a cloud over the industry." He denied that the Chamber qua Chamber had taken action in connection with the industrial unrest. "While the Chamber deplores the action of the workers," he said, "and would be pleased to see them return to work, it feels that it is not its legitimate function to intervene between them and their employers. The position of the Chamber is the same as that which it assumed in 1907 on the occasion of the miners' strike. I trust that when we next meet all difficulties will have been smoothed away, and that harmony between the workers and the mining companies will have been restored." Mr. R. W. Schumacher, in a brief reference to the subject, added: "This strike should never have arisen, it should not have continued, and now it must be ended as soon as possible. But there is only one way to end it, and that is for the men, and the mine employes to make up their minds that they will not allow themselves to be led by the nose by a handful of agitators who have nothing to risk and nothing to lose." Apropos of this, Mr. Schumacher told the following significant little story: "I remember at the last strike, in 1907," he said, "seeing one of the leaders, and I said to him: 'The end of this will be that you will lose your job and somebody else will get it.' He was one of the strikers on the mine. He laughed and said: 'I don't care: I am going Home and I want a holiday anyway.' I said: 'What about the men who can't go Home? What about the men with their families?' He laughed and said nothing. I assume that he had given these points no more consideration than has been given to them by the strike leaders of to-day." It is earnestly to be hoped that the men will take this warning to heart, and that the anticipations of an early settlement may be realized.

SIR DAVID HARRIS ON DIAMOND CUTTING.

AT the New Jagersfontein meeting, Sir David Harris was able to get in a final and effective word on the subject of diamond-cutting in South Africa. It may be remembered that Senator Munnik, in moving the appointment of a Select Committee of the Senate to inquire into the diamond cutting project, dismissed the question of the practical benefits of the producing industry to the country by declaring that "practically all this country had ever had of the £150,000,000"—i.e., the estimated value of the total quantity of diamonds produced since the industry has been in existence—"was the getting out of the stones by Kaffir and convict labour." What this "getting out of stones" really amounts to in actual practice, is illustrated by the case of the Jagersfontein Company. Sir David Harris was able to show the meeting that during the single year of the Jagersfontein under review, this company's total expenditure for winning their diamonds was £896,895. Deducting £48,896 for machinery and stores purchased and paid for in England, there was a balance of £847,999 actually spent within the Union on the operations entailed by the production of £1,259,983 worth of diamonds. In other words, as the Chairman emphasised, over two-thirds of the amount realised by the year's output was laid out within the Union for wages, railage, produce, coal, foodstuffs, and other necessary supplies which mining development demands. Apply the same proportion to the £150,000,000, and we have a hundred millions which may be considered, approximately speaking, to have been put into circulation in South Africa through the agency of diamond mining in the past forty years. Sir David dealt with the assertions that the world would rather give £11,000,000 than £10,000,000 for the 5,000,000 carats produced annually by the mines and diggings of South Africa, and at the same time that the large producers are astute business men. "If we sell for £10,000,000 diamonds that the world would gladly and willingly purchase for £11,000,000, the word 'stupid' would be more applicable than astuteness," said Sir David. The world's purchasing power, especially of luxuries, is limited, even the supply of money is limited. Of this there is ample proof in the failures lately of several States to float loans on the public, although the rate of interest was high, and the security undoubted. This result was not owing to any want of confidence in the Powers and States to pay interest, and to redeem their obligations, but to the lack of available cash. Sir David reiterated his view given before the Select Committee that in addition to the insuperable difficulty of transplanting an artistic and highly technical and skilful industry from its natural home, it was impossible to finance such an immense and gigantic business, in which long terms of credit were the essence and mainstay of the polished trade. According to this authority the permanent floating credit between the European banks, manufacturers, and dealers in brilliants amounts to at least £20,000,000, to say nothing of the credit given to retail jewellers. When the Union Government floated its last loan they contemplated issuing £1,000,000 of the amount in South Africa, but refrained from doing so owing to the pressure brought to bear by the banks and others, who asserted that this would result in the withdrawal of a large amount of cash from the banks which was being utilised for industrial purposes. In the face of this, how could the cutting and polishing industry be financed in this country? In support of his contentions Sir David pointed to the testimony of the Right Hon. J. X. Merriman, M.L.A., late Premier and Treasurer of Cape Colony; the Hon. H. C. Hull, late Finance Minister of the Transvaal, and subsequently of the Union of South Africa; Mr. J. W. Jagger, M.L.A., one of the leading merchants of South Africa, and a recognised authority on trade, commerce, and economics; and L. Wiener, Esq., a Capetown merchant, and past Chairman of the Chamber of Commerce, whose experience and knowledge of commercial questions is undoubted. Those gentlemen gave evidence before the Select Committee, and condemned the scheme of imposing an export tax on rough diamonds for the purpose of establishing the cutting and polishing industry in this country. In conclusion, the Chairman said: "Enormous sums have been lost from time to time in mining ventures in this country, properties have been developed, and machinery erected on which the whole subscribed and borrowed capital was lost. These unfortunate shareholders and creditors have never appealed to the State for a refund of any portion of the millions of pounds sunk in those ventures, but when a company is prosperous, and makes a fair return to shareholders, there are always a number of men who, like vultures, pounce down upon the industry either to cripple it or deprive it of its just and legitimate profits." If the words of the Minister of Mines, however, are to be taken literally, Sir David need be in no fear of any immediate interference by the State with the industry.

MINE NATIVE HEALTH QUESTION.

The meeting of the Chamber of Mines on Thursday provided the spokesmen of the industry with the first opportunity of dealing officially with the various allegations that have lately been made on the subject of native health and mortality. To Mr. John Munro, as President, fell the task of dealing with the subject, and he was supported by Mr. R. W. Schumacher, who, recognising the important issues involved, voluntarily came forward to endorse the President's remarks. Dealing with the accusation that the industry was responsible for the failure of the W.N.L.A. compound to send its mortality returns to the Native Affairs Department, Mr. Munro showed that this return was regularly supplied till July, 1911, when it was discontinued by arrangement between the officials of the two offices. As the return had never been published by the Department, the officials of the W.N.L.A. did not attach any great importance to the matter and failed to report it to the board. As this return is regularly supplied to the Portuguese authorities and the figures supplied in the Association's annual reports, Mr. Munro had little difficulty in proving that the charge of wilful suppression of facts was quite unjustifiable. The accusation made in this connection—made, it is true, by way of suggestion—that mine managers had been in the habit of sending Tropicals, who are seriously ill, to the W.N.L.A. compound to die, in order that the company's death-rate should not appear unduly high, was also disposed of by the President. He showed that all natives returning to their homes, whether East Coast or Tropicals, were repatriated by the Association, and naturally passed through its compound. As the total number of deaths during 1912 among Tropical natives, whether returned for repatriation on completion of their term of service or because of unfitness for work, was only eighteen, everyone will agree with Mr. Munro that "the accusation is as false as it is ungenerous." Coming to the attacks recently made by certain section of the local Press on the conditions obtaining in the mine native hospitals along the reef, Mr. Munro said: "We, as the responsible people have, with the advice of the Government Mines Medical Inspector, done everything to make these hospitals as perfect as possible, and are satisfied that the attacks are unjustifiable. The medical officers of the mines are quite capable of defending themselves, but I would like at the same time to point out that the general conditions in these native hospitals, both as regards medical and nursing attention, cannot be so grossly inadequate as has been stated, when it is remembered that the case mortality from pneumonia is under 20 per cent., while in the native section of the Johannesburg General Hospital, which is well known for the care and attention paid to its patients, it is higher than that figure." Mr. Schumacher supported Mr. Munro's reply to the "vague charges" against the mine doctors, made without notice or investigation. "We do not pretend," he said, "for a moment that our system is perfect, no system can be perfect. The attitude that we take up is that if there is anything wrong by all means let us know, let us investigate the matter at once, let us put things right. We are only too anxious to co-operate with the Department for Native Labour, and with any other Department in order to improve the conditions of health for our white and native labourers on these fields. Generally speaking, we must realise that there is room for improvement. If they did not realise that it would mean that we do not fully realise the great responsibility that lies on our shoulders. It may be that our figures for mortality, excluding tropical natives, compare quite favourably with the figures of mortality of industries in many other parts of the world. We must not be content until the figures for mortality compare favourably with the very best in other parts of the world." As a practical step Mr. Schumacher urged on the Chamber to consider immediately the bringing here of a man who has been successful in those parts of the world where the best records are to be shown. "Let us get the best man and that is the way to deal with this question satisfactorily." Plainly Mr. Schumacher is at one with Mr. Merriman and Mr. Samuel Evans in this regard, and it is to be hoped that his advice will result in the securing of one of the lieutenants of Colonel Gorgas, whose success at Panama was clearly in his mind when making the recommendation. At any rate, it is clear that native health questions are going to occupy an increasing amount of attention on the Rand—and it is, therefore, quite possible to regard the recent exaggerations and misstatements as a blessing in disguise.

THE HALF YEAR'S DIVIDENDS.

This Week's Declarations—Some Substantial Increases.

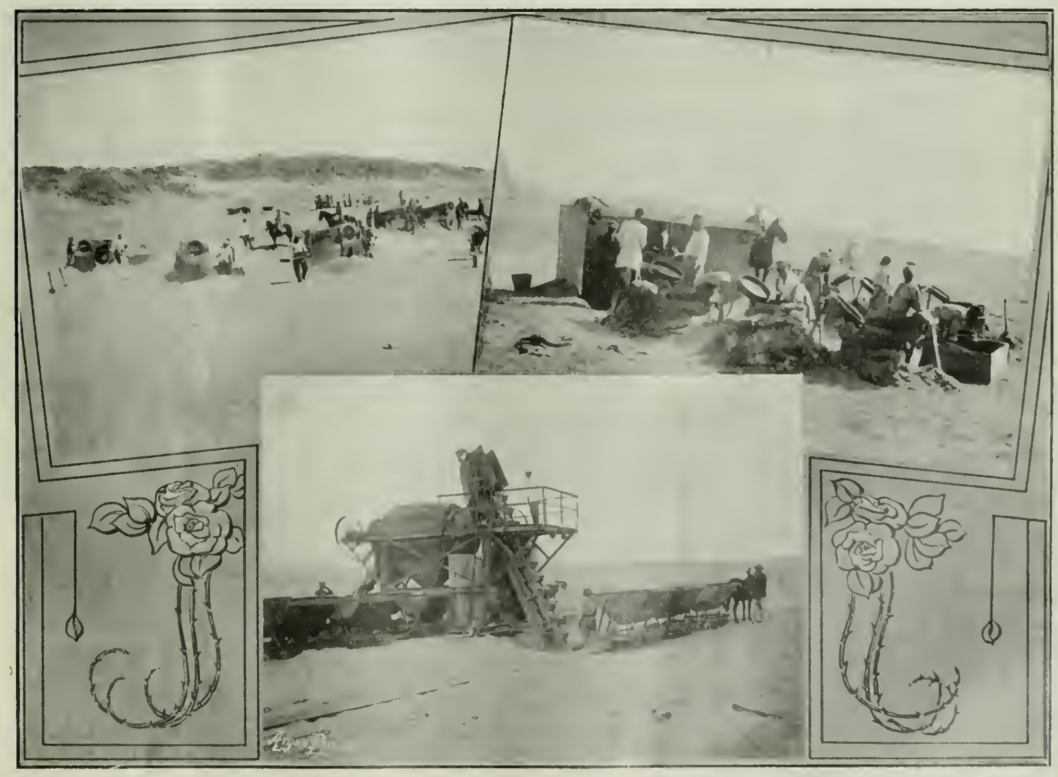
HEREUNDER is given a list of dividends declared by Witwatersrand gold mines for the half-year ending June 30th during the past week. It will be observed that a number of substantial increases in distribution have been recorded. In so far as the Central Mining subsidiaries are concerned, the Robinson is the only company recording a decrease, and this, as was explained by the chairman at the last meeting, is due to re-investment of funds. The Barnato declarations are dealt with in a separate note. Brakpan dividend is better than that declared this time last year, and the same may be said of the Wit. Deep of the Neumann group. We hope in our next issue to give a complete list for the half year.

Company.	Capital.	Date of Declaration.	Amount per cent.	Total Amount Involved.	Declaration 1912. First-half year.
CENTRAL MINING AND INVESTMENT CORPORATION.					
Bantjes	£502,306	June	5	£25,115	£25,115
City Deep	1,250,000	June	10	125,000	—
Crown Mines ...	940,106	June	55	519,058	519,058
Durban Rood. Dp	440,000	June	5	22,000	22,000
Ferreira Deep ...	980,000	Mar.	25	245,000	182,000
Geldenhuis Deep	585,753	June	10	58,575	58,575
New Modder ...	1,400,000	June	15	210,000	175,000
Nourse Mines ...	827,821	Jan.	10[1]	82,782[1]	
		June	10*	68,985*	82,782
Modder B	700,000	June	20	140,000	—
Robinson	2,750,000	June	8	220,000	343,750
Rose Deep	700,000	June	25	175,000	157,500
Village M.R	472,000	June	35	165,200	165,200
Village Deep	1,060,671	June	10	106,067	79,550
CONSOLIDATED MINES SELECTION					
Brakpan Mines ..	750,000	June	20	150,000	112,500
JOHANNESBURG CONSOLIDATED INVESTMENT COMPANY.					
Ginsberg	210,000	June	17½	36,750	31,500
New Primrose ...	325,000	June	30	97,500	81,250
New Unified ...	250,000	June	10	25,000	25,000
Witwatersrand ...	469,625	June	25	117,406	74,375
S. NEUMANN & COMPANY.					
Cons. Main Reef	924,364	June	5	46,218	46,218
Wit. Deep	550,000	June	15	82,500	68,750
A. GOERZ & COMPANY.					
May Consolidated	288,750	June	5	14,437	43,312

[1] For six months ending January.

* For five months ending June.

THE DIAMOND FIELDS OF GERMAN S.W.A.



Photos by E. Speer.]

SIEVE PARTY, CHARLOTTENTAL.

HANDWORKING ON THE PROPERTY OF THE KOLONIAL BERGBAU GESELLSCHAFT.

SIEVE MACHINE OF THE "K. B. G."

WEALTH OF THE DEEPER LEVELS.

Value Locked up Below a Depth of 5,000 Feet—£126,000,000 Estimated for the Central Rand.

The prolongation of mine lives on the Witwatersrand by acquisition of deeper and still deeper mining areas is a fascinating subject and one which, in view of Mr. R. W. Schumacher's references to the matter (briefly dealt with in our last issue), it is intended to devote further attention to in the course of this article. In so far as the near future is concerned the Central and East Rand only, *i.e.*, that portion lying between Roodepoort on the west and the Cinderella on the east, need be taken into consideration. On the West Rand the steep dip of the reefs renders it very unlikely that the lives of the Randfontein mines, for instance, will require prolongation through acquisition of deep level ground for many years to come, whilst on the Further East Rand the majority of the companies operating there under flat reef conditions own ground extending for such a distance from outcrop that the acquisition of further stretches of dip ground is a question that can safely be postponed to some future date. Companies operating on the Central Witwatersrand had their claim areas located under circumstances and conditions different to those obtaining when the Further East and West Rand claim areas were demarcated. Generally speaking, they were of much smaller extent, and were it not for wholesale amalgamation it is certain that most of the original outcrop concerns would long ago have been extinct.

The End of "Lateral Amalgamation."

The position to-day is briefly that lateral amalgamation—*i.e.*, consolidation of interests along the strike of the reef—has been carried out to what is probably the practicable limit of this policy. In other words, the existing Central Rand companies are scarcely likely to enlarge their claim areas, and thus prolong their lives by adding to their properties further ground situated either to the east or the west of the areas in question. To the south of these properties, *i.e.*, on the dip, there is, however, an almost boundless field for expansion. This "far south" area is dominated by the companies owning ground nearer outcrop and in so far as the Central Rand is concerned the Crown Mines, Village Deep, City Deep and Nourse Mines are so situated that the deeper levels of these mines must in the natural order of things come within the scope of their working policies. Three of these companies control ground from outcrop down to the most southerly limit deemed necessary at the present. So deep does the reef lie in the extreme southern section of these claims that the mines in question can extend operations and acquire additional deep level ground *ad lib.*, since it could pay no company to work the ground lying to the south of these extreme boundaries independently of the mines situated nearer outcrop. The Village Deep is in much the same position, save that it does not own the outcrop claims (now exhausted) nor does it possess the semi-deep level claims lying immediately to the south of this outcrop. This latter ground is, of course, the property of the Village Main Reef. Mr. Schumacher's noteworthy remarks on the indefinite prolongation of the lives of Central Rand mines through extension of operations in a southerly direction should tend to direct renewed attention to deeper level problems and aspects.

Crown Mines Company's Experience.

The matter is one of the very greatest importance not only to the Transvaal but to the world at large, for on the successful working of ground carrying reef at a depth of 7,000 feet and over depends the gain to the world of an enormous gold output. One is assisted to a realisation of the enormous amount of gold at stake when it is stated that last year the Crown Mines Company worked out 27 claims, from which the revenue was £3,071,000. In other words, for each claim exhausted gold to the value of nearly £114,000 was won. This no doubt is a rather high result, but if this is halved then every 1,000 feet of vertical depth, assuming the reef to be slightly under 30 deg. in its dip, would open up ore from which a quarter of a million pounds' worth of gold would be obtained for every 150 feet, the length of one claim along the course of the reef. Every mile of ground parallel to the course of the reefs would therefore, on this basis, yield per 1,000 feet of vertical depth the sum of £9,000,000. This is, moreover, a most conservative estimate, but it helps to indicate the enormous productive potentialities of the Central Rand. Some Witwatersrand mines are now working at a vertical depth of 5,000 feet, or something closely approaching thereto. At any rate, there are certainly no engineering difficulties in any way insuperable to profitable working at such a depth.

The Central Deep Rand's Potentiality.

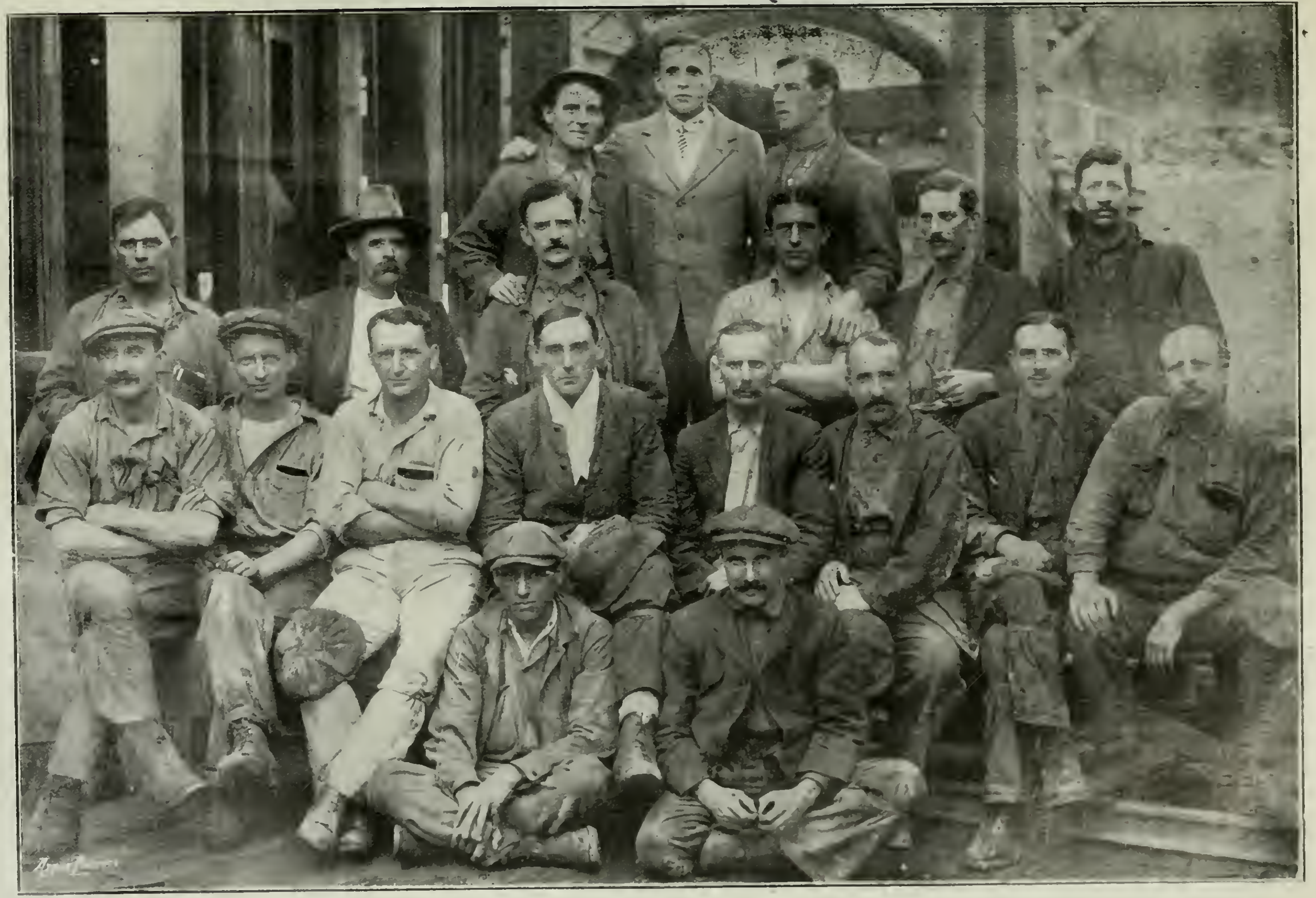
It may be recalled that at the Rand Mines meeting Mr. Schumacher said of the City Deep: "It is estimated that the reef will attain a vertical depth of approximately 7,000 feet before it leaves the company's southern boundary." He also spoke of the open claims lying to the south, and said of these it seemed natural that they will eventually fall to the City Deep Company "that will thus be able to follow the reef to the final depth at which it proves payable." One is tempted to indulge in a few interesting calculations as to the value of the gold locked up in the banket of the Rand between depths of, say, 5,000 feet and 7,000 feet—the former the present actual deepest workings, the latter the greatest depth which may be taken into practical considerations for many years to come. Reverting to the figures arrived at earlier in this article, it may be accepted as well within the bounds of conservatism that every mile of ground parallel to the course of the reefs will yield per 1,000 feet of vertical depth the sum of nine million pounds. On a basis of 2,000 feet, *i.e.*, the difference between the assumed depth datum lines of 5,000 feet and 7,000 feet—each mile should yield no less than eighteen millions sterling. Taking the heart of the Central Rand from the western boundary of the Crown Mines to the eastern boundary of the Nourse as seven miles, the sum of money represented in the deeper level section between five and seven thousand feet may on these bases be estimated at no less than £126,000,000. This figure is, of course, the result of mathematical investigation along the lines suggested from assumed gold contents per claim. It can only be regarded as an approximation, and it would therefore not be wise to attempt to follow it further and arrive at calculations as to probable profit, etc. The sum mentioned need not, however, be regarded as an idle exaggeration. The estimate errs probably on the grounds of conservatism, but it should serve to bring home to the world at large the enormous importance attaching to the exploitation of the deeper level areas of the Witwatersrand.

Village Main Reef.

The Village Main Reef made a net profit of £443,175 for the year, and has declared an interim dividend of 7s. per share.

The elimination trial for the Selborne Shield Competition, under the auspices of the St. John Ambulance Association, will be held in the Recreation Hall, Railway Headquarters Offices, on Sunday, the 6th of July. The final competition for the Selborne Challenge Trophy will take place in Johannesburg during the month of August, and the competitions for the Rathbone and Dewar Shields will also be held in Johannesburg during the month of November. The competitions for the Selborne and Dewar Shields are open to all members of the St. John Ambulance Brigade throughout the Union of South Africa, but the contest for the Rathbone trophy is only open to members of the St. John Ambulance Brigade employed on the mines within the Transvaal. Any information that may be required in regard to these competitions will be furnished on application being made to Mr. V. E. Davis, district secretary, St. John Ambulance Brigade, Railway Headquarters Offices, Johannesburg.

UNDERGROUND STAFF OF THE FERREIRA DEEP GOLD MINING COMPANY, LIMITED.



First Row (seated at bottom) : H. Becker, shiftboss; J. Richards, shiftboss.
Second Row : V. D. Smith, shiftboss; E. S. Burley, shiftboss; A. S. Holms, mine captain; G. Hildick Smith, underground manager; R. James, mine captain; T. Allinson, mine captain (retired); D. Y. Calderwood, mine captain; J. Kinsman, shiftboss.
Third Row : E. W. Richter, shiftboss: T. Tyacke, shiftboss; W. Hornbrook, shiftboss; K. P. Fitch, shiftboss; R. Hornbrook, shiftboss; P. Jordaan, foreman timberman.
Back Row : T. Duffy, shiftboss; V. Lefrere, underground manager's clerk: H. Schwartz, foreman timberman.

THE YEAR WITH THE NEW JAGERSFONTEIN.

Sir David Harris Reviews a Most Satisfactory Position.

THE results of the year's working at the New Jagersfontein, as explained by Sir David Harris at the annual meeting, show that the shareholders have every reason to be satisfied with the position. At last year's meeting the chairman foreshadowed the probability of there being 3,000,000 loads of blue on the floors by the end of 1913. By 31st March last 2,963,670 loads were actually on the floors, and but for a temporary check to hauling through a fire in the pump chamber early in that month, the management would have put down at least another 200,000 loads. Comparing the present position in this respect with the end of the financial year 1911, the quantity of blue on the floors has been more than doubled. It is hoped to further increase the stock to 3,500,000 within the next twelve months. The anticipation of a slight reduction in working costs has also been fulfilled, as Sir David Harris's forecasts invariably are, by the figures working out at 3s. 3·69d. as against 3s. 5·51d. last year. At the same time, the blue ground hauled shows an increase of 1,078,735 loads, and the ground washed an increase of 374,922 loads, for the year. Diamonds produced totalled 363,397½ carats, against 344,635 the previous year, which realised £1,259,983 3s. 2d., as against £1,116,432 7s. 9d., an increase of £143,551. The prices received were—for ordinary diamonds 72s. 10·74d. per carat, hopperings 55s. 11·19d., and old sortings 14s. 3·27d., as compared with 73s. 6·97d., 56s. 10·08d., and 12s. 10·38d. respectively for the preceding year. The chairman explained that the apparent decrease in prices was not an actual decrease, but was accounted for by the inclusion of grease table finds among the ordinary diamonds, by which plan a considerable saving is effected in working costs. The details of the balance sheet and profit and loss account are equally satisfactory. Among the points to which the chairman drew attention was the gratifying reduction of £112,898 13s. 10d. under the head of "sundry creditors," while another was the writing off for depreciation of no less than £122,738 10s. 3d. as against £51,885 1s. 1d. last year. Machinery and plant now stand at £200,000, as against £185,964 12s. 1d., the new six pan gear having been completed, a new washing plant erected, and a large compound and workshops built during the year. Stores have increased by about £15,000. The increased stock of blue ground stands at £222,275 5s. as against £139,015 17s. 6d. On these two items alone, blue ground and stores, the cash position has been improved by nearly £100,000. Cash at bankers, which was £509 10s. 3d. last year, is now £57,922 2s. 5d. All this indicates a continuance of prudent and careful financial control. The profit and loss account incidentally reveals an increase of £600 as "donations to charities." The diamonds sold realised £1,259,983 3s. 2d., which was £143,555 more than the amount received for the previous year. A substantial profits tax of £48,458 15s. 11d., or £5,723 15s. 7d. more than the previous year, goes into the coffers of the State, in regard to which the chairman pointed out that although the Act provided for the payment of a ten per cent. tax, as a matter of fact the company's contribution to Government represents 11½ per cent. of the profits divided amongst the shareholders. £288,567 16s. 7d. is carried forward, an increase of £66,485 15s. 7d. It is interesting to note, as contrasted with the £847,999 spent within the Union during the year in producing the diamonds, that the dividends paid amounted to £382,500, another illustration of how little ground there is for the suggestion so often made that the industry is one which virtually impoverishes the Union for the benefit of shareholders oversea. The amount paid in dividends during the year was £42,500 less than in the previous year—9s. as against 10s.—and the shareholders will doubtless welcome the chairman's intimation that the company having now provided out of profits for the enormous expenditure incurred during the past few years on capital account, need only anticipate normal expenditure for some time to come, so that he could with every confidence predict the normal dividend of 12s. during the current year, with every prospect of an increase later on. For this summary we are indebted to the *Diamond Fields Advertiser*. "In conclusion," Sir David said, "I think I may claim that I am able to place before you a fairly good summary of work done, and improvements in finances achieved during the year. We have increased the stock of blue ground on the floors by over 1,100,000 loads, decreased our debt by £100,000, completed the erection of a large washing plant, erected large and expensive compounds for the accommodation of the natives, written off £122,738 10s. 3d. for depreciation, and placed the company in a position to pay its normal dividends of 12s. during the current year, with every probability of an increase later on." All concerned are to be congratulated on a most successful year.

Companies in Jeopardy.

In accordance with the Companies Act, at the expiration of three months from this date the names of the undermentioned companies will, unless cause is shown to the contrary, be struck off the register, and the companies will be dissolved by the Acting Registrar of Companies:—

No.	Name of Company.	Date of Registration.
70	Alexandra Exploration and Development Syndicate, Ltd.	29/7/1887
154	Zoutpansbergsche Exploratie Maatschappij, Beperkt	26/7/1888
196	Hennops River Lime Works Syndicate, Ltd.	22/11/1888
339	Fern Gold Mining Company, Limited	28/5/1889
1578	The Samson Pulveriser and Milling Company, Limited	24/12/1898
1858	Heidelberg Coronation Proprietary, Ltd.	16/2/03
1933	Victoria Gold Mines Syndicate, Limited	9/5/03
2086	Madagascar Gold Mining Syndicate, Ltd.	16/4/04
2104	South Bonanza, Limited	18/5/04
2105	Bonanza Deep, Limited	18/5/04
2106	South Ferreira, Limited	18/5/04
2107	South Robinson, Limited	18/5/04
2199	Rhenoster Spruit Diamond Syndicate, Ltd.	25/11/04
2525	Inhambane Oil Union, Limited	2/6/06
2925	The Godiva Mica Syndicate, Limited	31/3/08
2944	Orient Trading Company, Limited	18/5/08
3219	The Groot Letaba Exploration Syndicate, Limited	21/9/09
3257	Star of Abercorn, Limited	19/11/09
3420	The Madagascar Exploration Co., Ltd.	26/4/10
3564	Schoen, Limited	31/8/10
3628	The Donerhoycul Tributing Syndicate, Ltd.	29/11/10
3646	L. A. Davis, Limited	23/12/10
3727	Metals and Industries (S.A.), Limited	13/4/11
3736	South African Aeronautical Enterprises, Limited	26/4/11
3782	Northern Farms, Limited	4/7/11
3807	Nylstroom Tins, Limited	5/8/11
3808	The Chemists and Laboratories Supply Company, Limited	10/8/11
3847	South African Mica, Limited	12/10/11
3899	The Rustenburg Orange Export Company, Limited	5/1/12
3936	Newtown Buildings, Limited	16/2/12
4063	The Kismet Gold Mining Company, Ltd.	13/9/12

Formal meetings of shareholders in the Aurora West G.M. Co., the New Steyn, Cinderella and Rand Collieries companies were held in General Mining Buildings, this week, for the purpose of confirming resolutions passed at the meetings held at the end of May. The resolutions concerned the amendment of the articles of association.

THE PROBLEM OF DUMP DISPOSAL.

A Question for the Industry—Past Attempts and Possibilities of the Future.

MR. J. A. YULE, the retiring president of the South African Institution of Engineers, made some interesting statements at the annual meeting of that important society on Saturday last. What seems to have attracted chief attention was his view that through changes in reduction practice the atmosphere of the mines was becoming more and more contaminated by dust blown from the sands residue heaps.

METALLURGICAL REVOLUTION.

The great changes that have taken place in Rand metallurgical practice of recent years have received constant and detailed consideration in this journal, and, as stated by Mr. Yule, the outstanding features have been (a) the increasing duties of stamp heads brought about by the use of heavier stamps, coarser screening, and tube mills, and (b) tremendous development in slime treatment practice. As to the former, the latest statistics issued by the Chamber of Mines—those for the month of May—show that there were during that period 9,562 stamps and 281 tube mills at work and that these milled 2,366,726 tons, or 8·9 tons per stamp per day. As to the second point, it has been a remarkable and almost revolutionary change that has brought about a desire on the part of metallurgists to slime mill pulp and recover gold from this product rather than to avoid slime and bring as much crushed ore as possible into the cyanide works in the form of sand. Slime, once the bugbear of metallurgists, is now, it seems, almost welcomed as the tremendous developments in the methods of recovering gold from very finely comminuted ore which have taken place during recent years—in filter pressing, for example—clearly indicate. The views of the retiring president on these points scarcely can be quarrelled with, but Mr. Yule went on to deal with the causes of these policies and said "there would be a gradual shifting of the Johannesburg population towards the northern boundaries of the town unless someone came along with a scheme which would retain the sands on the dumps, instead of permitting them to blow to the four winds of heaven. Those who remembered the winters of a few years ago could bear him out when he said that sands were now ten times as prevalent in the residential portions of the town as they were five years ago." Mr. Yule is the resident engineer of an important "town" mine—the Langlaagte Estate—and he is certainly entitled to speak of the effect of dust or residential conditions with authority.

WAYS AND MEANS.

The discharge of so much fine sand into the atmosphere is certainly a curse to dwellers along the reef, and if anything can be done to mitigate this evil it is certain that it will be done, for the controllers of the industry are fully alive to the disadvantages of the Rand's unsightly dump heaps. Sand filling suggests the most practicable remedy and it has a double merit in that not only does it improve living conditions on the mines but it also betters the underground workings and makes them more secure and safe. But sand filling cannot be carried out on a scale sufficiently large to entirely dispose of the problem. "What to do with our dumps" has been a matter that has exercised the minds of the directors of the industry for years past. Some little time ago attempts were made to discover some member of the vegetable kingdom that would grow on such inhospitable soil. Had such been found, it would have rendered "the mountains of the Main Reef" less unsightly and would certainly have tended to alleviate the dust nuisance. But unfortunately these researches were futile. A more practical endeavour has been carried into effect at the Princess Estate and other mines, where waste rock from the crusher and sorting stations is deposited on the face of the sands heap. Then, again, in designing new plants much can be done by so laying out residential quarters in relation to the situation of the residues dump that the prevailing winds may blow the sands away from instead of on to houses and offices. This, it is understood, was a consideration in the lay-out of the Van Ryn Deep surface equipment. It is a great pity that these discharged sands are wholly lacking in cohesive properties. Were this not so, some use might be found for them as bricks or some other kind of building material. Possibly some ingenious mind may yet devise some process or substance which can at small expense supply deficiences which would render these dumps heaps of some economic worth instead of being, as they are to-day eye-offending nuisances.

DISCUSSION INVITED.

At any rate, the matter is worthy of more thorough consideration than has yet been accorded it. Mr. Yule's timely remark will, it is hoped, stimulate discussion on the matter. We would welcome any expression of views on the problem in the columns of this journal.

Assays and Analyses of Mineral Samples from Prospectors.

Applications are invited by the Union Government for assays and analyses of samples of minerals to be undertaken for the benefit of prospectors and for quotations for fees as detailed in the schedule below. All samples will be forwarded to the successful applicant through the office of the Government Mining Engineer and all fees received will be remitted monthly by that office. The arrangement will be in force for one year from the 1st August, 1913, notice to be given from either side one month before the expiry of the year as to whether the arrangement will be terminated. Applications, marked "Tender for Assays," must reach the office of the Government Mining Engineer not later than the 15th July next. It is a condition of acceptance of any tender that the successful applicant will not make use of any title or advertisement other than the following: "Contractor to the Government for the Assaying and Analysing of Prospectors' Samples under Government Notice No. 965 of 1913." The Government does not bind itself to accept the lowest or any tender. Schedule: (1) Fine gold; (2) gold and silver; (3) silver; (4) copper; (5) tin; (6) lead and zinc; (7) lime and magnesia; (8) iron; (9) graphite; (10) arsenic, antimony, nickel, cobalt, manganese, bismuth, or mercury; (11) chromium, tungsten, vanadium, or molybdenum; (12) platinum and allied metals; (13) complete analysis of coal with evaporative power; (14) coal, evaporative power only (Thompson's method); (15) coal, evaporative power only (Mahler bomb method); (16) coke; (17) complete quantitative analysis; (18) complete qualitative analysis.

Pretoria Portland Cement Co.

A dividend (No. 11) of 20 per cent. (4s. per share) has been declared for the half-year ending June 30.

Pretoria Copper and Tin Fields.

A meeting of shareholders in the Pretoria Copper and Tinfields, Ltd., was held in Standard Bank Buildings yesterday, Mr. D. Symons presiding. A resolution was passed authorising the voluntary winding-up of the company. Messrs. George McKenzie and Harry Cohen were appointed liquidators, and their remuneration fixed at £250. A meeting of shareholders will be held on July 12 for the purpose of confirming the resolution carried at Wednesday's meeting.

TIN FIELDS OF THE NORTH.

An Important Congo Producer—The Muika Mine—Prospects of Northern Rhodesia.

It has taken some years for the Metal Markets to recognise that in Africa the world has a great potential producer of cassiterite. Already the Transvaal production is worth £400,000 per annum, whilst in many other parts of the continent, notably in Nigeria, promising deposits are being from time to time discovered. There can, too, be no denial of the fact that in the Katanga District of the Belgian Congo there are enormous stretches of country known to be stanniferous. Whether any really extensive and profitable mines will be located or not, it is at this juncture impossible to say, but it may be news to many to learn that there is at present a Congo mine which is shipping ten tons per month to Europe, and which it is hoped will be producing considerably more in the near future.

The Mine Described.

This is the Muika Mine, near Kiambi, owned by a proprietary company, styled the "Recherches Minieres du Bas Katanga," and it is the principal proposition operating for tin in the Belgian Congo at the present time. The various lodes are described as covering a width of nearly nine kilometres, and are of a pegmatite and greissen nature. In many instances these lodes are said to have a great width and value. At present there is a small five-stamp battery running, with the necessary dressing and concentration plant, including the usual round Frames, automatic frames, etc. This plant is running well and doing good work, and so far as the ore is concerned this lends itself eminently to concentration on account of the lightness of the gangue and the large crystallisation of the cassiterite. At the moment this company is shipping monthly ten tons of cassiterite to Europe, and it is hoped in the near future that this amount will reach from fifty to seventy tons per month. Mr. R. H. Gwyn-Williams, the manager, is now on his way to Europe to arrange for the installation of a larger stamping and dressing plant, and with this expenditure it is expected to make Muika the premier tin producing mine of Katanga.

Tin in Northern Rhodesia?

The existence of tin stone in the Belgian Congo is no new discovery. As a fact it has been recognised for some years past that this wonderfully mineralised territory, in addition to its copper and gold deposits, contains tin-producing possibilities as well. Mr. Frecheville, during his visit to the Kantaga on behalf of the Tanganyika Concessions Company, six years ago, visited the Busanga Tin Field, and though his views were cautiously couched and in no way savoured of optimism as to the future of this field, the existence of cassiterite there was unquestioned.

From various rumours that have from time to time reached us it appears not improbable that some portions of adjacent British territory may also prove to be cassiterite bearing. Livingstone, we believe, mentions meeting with natives engaged in tin smelting operations close to the Zambesi River. The great explorer's observations in regard to minerals, as in connection with other things, have proved to be wonderfully accurate in most instances, and as in certain parts of Northern Rhodesia the geological conditions appear to be quite favourable for the presence of cassiterite, it will not be surprising to learn at sometime of the discovery of a tin field in Rhodesia to the north of the Zambesi River. This, too, quite apart from the southern dependencies of Matabeleland and Mashonaland, in which the occurrence of tin stone is a proved fact. As to Mashona land, it may be remarked that the Chisawasha properties, situated to the east of Salisbury, and in which one or two prominent Randites are interested, are understood to be developing satisfactorily under the direction of Mr. J. R. Williams. It is hoped that time and development will prove the existence of a large low-grade, but profitable mine or collection of mines in this locality.

REVIEW.

The Diamond Lady. (Dranes, Danegeld House, Farringdon Street, E.C.)

We have received for review a copy of a book entitled "The Diamond Lady," "A Quest for Diamonds," by the Countess Berita de Montalvo, with an introduction by Albert J. Barnett. Frankly, we do not like it; we do not like the text and we do not like the photographs. Amongst other gems in this book are specimens of chats between the titled authoress and a visitor. We give an example:—

Visitor: "Still here?"

Myself: "Yes, we shall remain here till we leave."

Chapter XIV. is entitled "What is a Diamond?" and in this the authoress displays considerable geological knowledge, judging from references to the "deposition of the Stormberg beds" and "basic silicate magma," etc. Apparently the diamond-seeking expedition which the Countess de Montalvo and Mr. Barnett went on (presumably in the Vaal River diggings area) at last produced a diamond. One more quotation—the final sentences in the book—must suffice:—

The whole of that day they all worked like Titans, digging up gravel, and babying and sifting it; we were anxious to have some of the gravel washed before knocking-off time, but we feared that, as the sun was setting and we were getting a "slant" light, we might not be able to "spot" a diamond; however, we wanted to know if the cranes had brought us luck, so we washed a sieveful of gravel, then a second, and then a third, and, as the last was turned over, there in the very centre of the gravel blazed, with the setting sunlight upon it, a large mackle—our first diamond!!! "By gum," shouted our Superintendent, "it's a magnificent 'mackerel'"; forthwith our leader triumphantly "fished" it out, and, dipping it into water, gallantly christened it, after me, "The Berita Diamond." The mackle diamond, being triangular in shape, is invested by many with cabalistic attributes, and regarded as a harbinger of good luck; ours has left nothing to be desired in the latter respect. I was anxious to celebrate the event in a fitting manner, so I thought that as our leader was an Englishman nothing could be more appropriate than to run up the British flag, but as none was procurable in this out-of-the-way part of the world, I sacrificed three of my blouses, and made a Union Jack out of them, which, after having done duty to mark the spot where our first diamond was found, was transferred to our tent, to wave thenceforth from one of the safety guy-ropes. The news of our find spread with mysterious rapidity, and the next day we were favoured with another call by our previous visitors, including the driver with his Cape cart. As I was returning from the diggings I saw them grouped about the tent, and on my approaching them they greeted me with, "We hear you have found diamonds"; turning to the chief sneerer of the party, I replied: "Yes, the 'd—— fools' have found them." As they went off, the driver of the Cape cart shook hands with me, and said, "Well, missus, if I was you, I'd keep hens now."

ENGINEERING PROGRESS ON THE RAND.

Outgoing President of S.A. Institution of Engineers Reviews Tendencies.

In his valedictory address read before the South African Institution of Engineers, Mr. J. A. Yule said:—I have to congratulate the Institution on a successful year's work; a year of considerable progress in all directions. We have issued our first reprint of proceedings (a step in advance as important as that made when we first published our *Journal*), we have formed our first branch, and we have received the first visit from one of the engineering centres outside the Rand. I think that the Institution can claim that these constitute most important advances in our history as a technical society. The Council's report and accounts speak for themselves and have been before the meeting, and therefore it is not necessary for me to refer to them further than to congratulate members upon the strong position on which they find the finances of the Institution are based. I might urge the imperative necessity of members ensuring a steady progress by their individually as well as collectively uniting in furthering the Council's endeavours. The objects of the Institution should appeal to all engineers (irrespective of the section of engineering to which they belong), and it should be the duty of each member to bring the Institution forward on all possible occasions, rather than to work on the principle that there is always someone else who will do the work. It is necessary for everyone to put his shoulder to the wheel rather than to stand by and admire what others are doing. As regards the actual engineering work of the year, I propose to consider matters from the points of view of (1) the mechanical engineer, (2) the mining engineer, (3) the civil engineer. In the mechanical section, bearing in mind always that "mechanical" covers "electrical," the greatest developments have been in the direction of the increased use of electrical power, and the greater prominence accorded to the tube mill in mining mechanics. With the electrical power increase there has also been the increased use of the steam turbine. I notice that there is a tendency on the part of the electrical section of the mechanical engineers to claim the use of the steam turbine as a portion of the electrical advance. As a steam as well as an electrical engineer, I must put forward a claim to the steam turbine as being purely a steam engineering advance; indeed I go further and state that without the steam turbine improvements of recent years there would not have been anything like the advance in electrical practice which is now apparent. Tube mill improvements, with which many members of our Institution have been identified, and to which two members of our Council have devoted their attention, are tending to revolutionise the gold industry, and incidentally to alter our social amenities. The gold industry is being revolutionised by (1) the increased capacity of the gravity stamp, and (2) the fine grinding of pulp causing the proportion of pulp going to the slimes plant to be greater than that going to the sands plant, a direct reverse of conditions which existed until quite recently. The social amenities are being changed, due to the enormous amount of fine sands which is being daily (or perhaps I should say dry daily), discharged into the atmosphere from the dumps. Naturally, sands filling with current sands is the simplest solution, but all mines do not sands-fill, and there must be some solution of this problem open to the mines which dump their sands. Those who remember the winters of a few years ago can bear me out when I say that sands are now ten times as prevalent in the residential portions of the town as they were five years ago. In the mining section the greatest development has been shown in the direction of centralized organization. We have had a paper during the year from Mr. Warriner on this subject and his paper was of such outstanding merit as to win the Institution's gold medal for the year, and it is unnecessary for me to refer further to this subject, as Mr. Warriner's paper is the best pronouncement on the subject which can be made. In civil engineering there has been a steady progress, but nothing startling. I think that we can look to this section for the greatest promise of progress for the next few years. There is one section of this work which, as many members know, particularly appeals to me. I refer to irrigation. I do not propose to go into a lengthy statement of my ideas on this subject, but I would like to point out how imperative it is for the development of this great country. We have a rainfall which is not only irregular, but which is also confined to certain periods of the year. The average annual rainfall is sufficient for the agricultural and domestic necessities of the country, but no provision is made to retain the water, which falls in excess of immediate requirements, for use in the dry season. In fact, we have the peculiar condition that during periods of rain there is serious surface denudation and almost immediately after the cessation of rains there is a serious scarcity of water. For millions of years, or so we understand, the rains and their products the streams and rivers, have been planing off the rocky outcrops, converting them to grains of sand and earth, and carrying them to fill up the hollows in earth and in oceans. In a few million more years, were the process to be uninterruptedly continued, there would be no more mountains, in fact no more land; all would have been washed down to one common level, and we should have a globe all water surface. Naturally, we have no interest in what will be the condition on this sphere some millions of years hence; but the present conditions do interest us, and the cutting of spruits and gullies by flood water is quite a serious matter; therefore, anything tending to improve it must be of importance. I would venture to state that the agricultural progress of this country will be measured by the development of irrigation, and the irrigation improvements will be measured by the colour of the water in our rivers. Very many millions of tons of soil must have been carried away during the last ten years by the Vaal River, whose muddy colour is almost solely due to soil in suspense; therefore, instead of enriching the country this and other rivers are carrying it away. I now wish, in vacating the chair, which I am proud to have occupied for the past year, to thank the members for their leniency towards me and the members of the Council for the great assistance they have given me during my year of office. In presenting to you your new president, Mr. W. Calder, I would ask you and your Council to extend to him the same unfailing assistance and courtesy which I have invariably received.

South African Geology.

Dr. George S. Corstorphine, Principal of the S.A. School of Mines and Technology, delivered a lecture on Geology last week at the S.A. School of Mines Buildings, under the auspices of the South African Lecture Committee. In the course of his address, Dr. Corstorphine said: Here in South Africa we have in the interior ancient land surface which has been subjected to weathering for long geological ages. Most of the hills are consequently not due to any orgiinal uplift, but to the fact that they are the remnants of former plateaux, of which a great part has been carved away. The Karroo scenery is essentially of this type, and so are our granite kopjes of the Central and Northern Transvaal, and the conglomerate hills of the south coast of Cape Colony. On the other hand, mountains like the Zwartebergen and Langebergen, in the Cape Colony, and the hills around Parys, in the Vaal River basin, are true mountain chains formed in the same way as the Alps and the Himalayas by relative upheaval due to compression and folding of the earth's crust. For some perhaps quite prehistoric reason, we prefer the violent explanation of natural phenomena rather than the gentle, and generally we prefer to-day even to think of violent cataclysms as having been most important in the earth's history. It is not so, however. It is "the gentle rain from heaven," the silent but relentless action of sun and frost, the activity of the wind, the river and the sea which play the chief part in producing change in the earth's surface, and incidentally in disintegrating a granite and rearranging the fragments as a conglomerate or a sandstone. Our terra firm is but a terra infirma—the hills are far from everlasting; change is the very essence of the world's history.

GRADE COSTS AND PROFITS IN MAY.

Slightly Reduced Yield and Costs—Rand Profit, £1,099,397.

The usual monthly analysis of the gold production for May issued by the Chamber of Mines is presented hereunder:—

THE WITWATERSRAND.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West United ..	19,531	26	2	19	10	14,795	4,743	6	4
2. Bantjes Consolidated	39,687	25	10	21	4	32,809	6,434	4	2
3. Brakpan Mines	80,754	28	5	18	9	52,951	27,067	9	7
4. Cinderella Cons.	18,962	23	4	28	11	23,292	*4,065	*5	1
5. City Deep	82,695	38	6	25	5	53,834	27,143	12	10
6. City and Suburban ...	52,489	38	1	21	5	29,511	22,281	16	2
7. Cons. Langlaagte	66,031	26	5	17	3	42,929	23,101	9	3
8. Cons. Main Reef ...	36,225	29	1	20	2	24,720	11,087	9	0
9. Crown Mines	286,433	29	3	16	11	165,592	119,589	12	2
10. Durban Roodepoort ...	15,423	21	2	15	9	11,269	4,139	5	9
11. Durban Rood. Deep ..	40,748	28	10	23	6	32,069	8,248	6	1
12. East Rand Proprietary.	258,419	29	8	18	8	158,853	90,493	10	8
13. Ferreira Deep	126,213	43	5	19	6	56,745	68,251	23	0
14. Geduld Proprietary ...	18,783	24	10	22	8	16,504	2,196	3	0
15. Geldenhuis Deep	88,807	29	6	23	4	70,082	18,255	6	1
16. Ginsberg	21,018	27	2	19	6	15,129	5,890	7	7
17. Glencairn Main Reef ...	16,430	14	2	12	7	13,859	1,760	1	7
18. Jumpers-cum-Treasury .	11,532	39	2	38	8	9,852	1,007	3	11
19. Jupiter	44,363	20	11	18	9	39,794	4,507	2	1
20. Knight Central	27,895	21	6	19	8	25,561	2,008	1	6
21. Knights Deep ...	81,191	14	8	10	6	58,317	22,031	4	0
22. Langlaagte Estate .	60,628	19	6	16	10	46,309	15,000	5	5
23. Luipaardsvlei Estate .	18,992	20	11	18	2	16,494	2,244	2	6
24. Main Reef West	31,272	28	10	22	10	24,376	6,478	6	1
25. May Consolidated . ..	14,183	18	3	13	0	10,129	4,020	5	2
26. Meyer and Charlron ...	33,672	45	3	17	4	12,899	20,642	27	9
27. Modderfontein B. ...	66,927	37	1	15	5	27,782	38,859	21	0
28. New Goch	27,270	19	5	16	2	22,661	4,535	3	3
29. New Heriot	22,165	34	8	20	8	13,230	9,013	14	1
30. New Kleinfontein . ..	70,189	31	2	19	8	44,394	25,007	11	1
31. New Modderfontein ...	98,747	37	10	19	3	50,295	48,041	18	5
32. New Primrose .	36,437	27	4	13	4	17,692	18,743	14	2
33. New Rietfontein .. .	17,250	21	6	19	10	15,943	1,307	1	7
34. New Unified	16,048	25	2	17	5	11,031	5,018	7	11
35. Nourae Mines . .	81,115	30	9	22	2	58,124	22,658	8	8
36. Princess Estate	28,927	25	3	23	7	26,844	2,005	1	9
37. Randfontein Central .	292,108	24	4	17	1	204,465	84,180	7	0
38. Robinson	107,259	34	2	13	1	40,960	65,575	20	11
39. Robinson Deep	84,993	26	7	15	9	50,282	32,144	10	1
40. Roodepoort United ..	26,939	16	5	15	0	24,711	2,248	1	4
41. Rose Deep	93,293	26	9	16	7	58,108	34,843	10	0
42. Simmer and Jack .	73,783	18	6	10	11	43,700	29,435	7	5
43. Simmer Deep ...	52,217	16	7	14	8	46,212	5,489	1	9
44. Spes Bona Tribute .	6,499	20	9	—		—	—	—	
45. Van Ryn	55,807	27	7	15	2	30,478	25,481	12	8
46. Village Deep	77,389	30	6	18	11	48,038	28,974	11	5
47. Village Main Reef	65,525	32	11	18	4	36,439	27,815	14	0
48. Vogelstruis Estate... ..	15,903	22	4	19	8	13,399	2,537	3	8
49. West Rand Central ...	3,381	28	2	29	1	3,212	168	1	6
50. West Rand Cons.... ...	47,375	29	2	22	3	36,218	11,059	6	10
51. Witwatersrand	51,113	26	4	14	10	28,887	22,229	11	5
52. Wit. Deep	68,002	28	7	16	11	40,150	27,161	11	6
53. Wolhuter	37,941	25	1	18	1	27,112	10,325	6	11
Miscellaneous producera	17,026	—		—		—	—	—	
Witwatersrand totals	3,234,004	26	11	17	7	2079044	1099397	9	4
				52 cos.		52 cos.	52 cos.	52 cos.	

*Loss.

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
HEIDELBERG—									
1. Nigel	20,002	29	3	24	9	16,323	3,456	5	3
2. Sub Nigel	10,093	40	3	31	6	7,884	2,082	8	4
BARBERTON—									
3. Barrett	905	5	8	—		—	—	—	
4. Sheba	13,771	43	3	28	3	8,991	4,779	15	0
5. Sheba-Rosetta	1,716	—		—		—	—	—	
6. Worcester	5,760	17	9	12	2	3,950	1,810	5	7
KLERKSDORP—									
7. Quest	3,262	15	3	14	11	3,187	77	0	4
LYDENBURG—									
8. Ceylon Lydenburg ...	1,121	36	5	22	6	695	404	13	1
9. Glynn's Lydenburg ...	6,652	42	4	23	8	3,734	2,780	17	8
10. Transvaal G.M. Estates	43,773	56	3	21	0	16,053	26,414	34	6
Miscellaneous producers	32,938	—		—		—	—	—	
Total (outside districts)	139,994	38	2	22	4	60,817	41,805	15	4
				8 cos.		8 cos.	8 cos.	8 cos.	
Grand totals	3373998	27	3	17	9	2139861	1141202	9	5
				60 cos.		60 cos.	60 cos.	60 cos.	

A comparison of value recovered per ton milled, working costs and profits per ton with April shows that the value recovered on the Witwatersrand for May was 26s. 11d. or 7d. per ton less than in April. Working costs in May were 17s. 7d.; in April 17s. 11d.; in March 17s. 8d., February 18s. 3d., and for both January and December 18s.

The annual meeting of the South African Association of Analytical Chemists was held this week under the chairmanship of Dr. J. M. McCrae. Mr. Gray, the secretary, read the annual report, which contained, among others, the following items of interest: A circular letter. together with list of members, was circulated towards the end of last year to members of the Cabinet, heads of Government Departments, Municipalities, etc., drawing attention to the objects and functions of the Association, and in many cases sympathetic replies were received. Representations were made to the Public Service Commission in connection with the salary, inadequate in the opinion of the Council, offered by the Government for a chemical assistant, but beyond a formal acknowledgment of the letter nothing has been heard. The matter will, however, be kept in view and representations made as occasion arises. The President was approached by the Chemical, Metallurgical and Mining Society of South Africa and asked to act as an adjudicator in connection with the competition for the best method of "Assaying gold in the presence of the platinum metals," held under the auspices of tho Society, which offer was accepted. It is interesting to note that the other two adjudicators, viz., Professor G. H. Stanley and Dr. J. Moir, are also members of Council. The Council was approached by a Rhodesian chemist suggesting that the scope of the Association should be extended to Rhodesia, and the gentleman in question was informed that, provided he could obtain sufficient local support, the matter would be considered in general meeting, owing to an alteration in the constitution being necessary. No further communication has been received. The possibility of obtaining a private Bill for the registration of analytical chemists within the Union of South Africa is kept in view by your Council, and our resources will be carefully husbanded to this end. On the Chairman's motion the report was unanimously adopted. In the course of his presidential address, Dr. McCrae said that they had good reason to look forward to a great future for the Association. Their difficulty was to get a controlling organisation, which would restore the title, analyst, to competent and qualified persons. The main object of tho Association was to maintain a high standard for chemists. In many ways they were responsible for the health of the people, and it was their duty to catch the wily food adulterator. The community should be protected, but unfortunately the public was ignorant of the dangers it incurred. With education their Association's position would become appreciated by the public. In conclusion, the speaker said honesty and accuracy should be on their minds always. A vote of thanks was accorded Dr. McCrae for the way he had represented the profession. The election of members of the Council of the Association was as follows: Dr. J. McCrae, Professor E. H. H. Stanley, Mr. James Gray, F.I.C. (Johannesburg), Dr. C. F. Juritz (Capetown), Professor R. B. Denison (Maritzburg), Dr. Jurin (Johannesburg), Mr. J. S. Jamieson (Durban), Mr. A. Whitty (Johannesburg), and Dr. R. Marloth (Capetown).

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THE ADVANTAGES OF STAGE OR GRADUATED TIN ORE CRUSHING.

Lessons from Cornwall—Some Expert Opinions from the Duchy.

RECENTLY at the Camborne School of Mines, Mr. Josiah Paull (president of the Cornish Association of Mining, Mechanical and Metallurgical Engineers) gave a paper on "The Advantages of Stage or Graduated Crushing," which will be read with interest by the mining men in South Africa.

POINTS ABOUT WOLFRAM.

In the course of his paper, the President said at the last meeting Mr. W. Thomas mentioned that he did not consider at the present time that the average recovery of the tin made by the mines of the county exceeded 60 per cent. of the chemical assay of the ore crushed, and that he could give an instance where recently only a 40 per cent. was taking place. In referring to this statement, he (the President) felt confident that he should be correct in stating that the excessive loss referred to was either due to the ore being crushed too fine, or through lack of proper classification and suitable dressing plant for concentrating tin from the waste. During the twelve years he had been in Cornwall it had been his misfortune, or otherwise, to be responsible for a mine with a complex ore. At Clitters, where he was for about seven years, the ore contained tin, wolfram and copper pyrites, while at South Crofty, where he had been for about five years, it was tin, wolfram, arsenical and copper pyrites, though, as far as copper was concerned, he was sorry to say it was as regarded recovery almost a negligible quantity. Wolfram and arsenic, however, were important products, and last year Crofty's returns of those two products realised £21,040, while the company's nett profit was only £25,200. Wolfram and arsenical pyrites made a much higher percentage of slime in crushing than tin, and when he started experimenting with larger screens than 20-mesh, more with the idea of improving the wolfram or arsenic recovery than for improving the tin extraction, he was pleased to find that it proved an advantage in the case of tin also. The tests he had made gave ample proof that wolfram slimed much more than tin, and they proved it, he was sorry to say, at Crofty, inasmuch as they made a considerably lower recovery, and he was sure this was due to the wolfram sliming. Further, why the wolfram did not make its presence felt more in the tin sold from Crofty in the old working of the mine was because in crushing through perforated screens of such fineness the bulk of it was crushed to such a degree of fineness that it merely formed a colour in the water and did not interfere in the dressing of tin.

In order to compare recovery results, he had taken figures for two complete years, and the returns of tin and wolfram for the same period—1910-1912. In the former year, 20-mesh screens were being used, and in 1912 14-mesh and a small percentage of 10-mesh. The increase in the wolfram recovery was 3.93 per cent., and although he had no figures regarding the arsenic recovery, he was quite sure there was a considerable improvement in the recovery of this product as well. In 1912 a lower grade ore was treated, but had the grade been equal for the two years, he was of the opinion that the difference in the recovery would be still in favour of the coarse mesh, as they all knew that the lower the grade going into the mill, the more difficult it was to keep up the percentage of extraction. By using the coarse screen they crushed 5,160 tons more than in 1910, the only extra expense being the installation of two additional pulverisers, and having to regrind an extra 12 tons per day, or 4,380 tons per annum. The cost of pulverising the extra quantity was 11½d. per ton, or £209 17s. 6d. for the year, against a save of 3¾d. in the crushing and dressing costs on 66,076, the nett save per ton crushed, as far as the battery and dressing floors was concerned, being 2.99d. per ton of ore entering the battery, or just over £800 per annum.

After describing in detail the principal points in the treatment from the time the ore arrived at surface, the lecturer said he was of the opinion—he might be wrong, but was open to conviction—that on all the Cornish mines fairly coarse crushing in the first instance could be indulged in, provided that a suitable concentrator was used, making more than two products. He was quite prepared to admit that some of the tin was very fine indeed, but he also believed that a fair quantity was moderately coarse, and his idea was to keep that portion coarse as long as possible, and not to keep on pounding it up in the stamps until the very fine tin was also free.

DISCUSSION.

Captain Jos. Jennings (superintendent East Pool and Agar, Ltd.). was very grateful to the president for his admirable and valuable paper. Personally, he believed in coarse crushing for the production of all minerals. There had been no great bunches of tin discovered in Cornwall since the great bunch at Carn Brea about twenty years ago. Since that time ore values had been continually dropping, and managers had been on the look-out to see if some means could not be discovered to counteract the fall. As they grew older they became more experienced. In South Crofty, Capt. Paull had amply demonstrated that coarse mesh screens, as far as the mine returning complex ores was concerned, meant a higher extraction. He was pleased to say regarding East Pool that they had been able to adopt this method, and they had changed from 27 mesh screens to 15. The change not only increased the capacity of the mill, but the extraction of tin and wolfram. There was still plenty of room for improvement, although there was an extraction of 75 per cent. He thought means would be discovered which would prove it was possible to make the extraction 80 per cent. Wolfram at South Crofty, East Pool, and Carn Brea had been a source of trouble for many years, at least as long as wolfram had any value, and its extraction had been increased by the adoption of coarser crushing. That Association should congratulate the manager of Crofty on attaining a 75 per cent extraction. He did not believe there was another mine in Cornwall, or anywhere else, that could show such a high percentage. This went to prove that cross-cutting and classification was a long way by which the extraction could be increased. Since the introduction of 14-mesh screens at East Pool the extraction had risen to between 70 and 71 per cent. on the tin ticketing. One day he hoped it would be as high as Crofty, and even higher.

COARSE CRUSHING APPROVED.

Mr. J. C. Cann (St. Ives) agreed that coarse crushing was the proper method to adopt. He thought the tube mill was far from an ideal machine for the purpose. If the lighter stamps of the Holman or Californian type were installed for the secondary crushing with a lower drop a greater number of blows per minute, better economy and efficiency would be the result. The ore at Giew mine was fairly simple, but the lode matter was of a very plain nature. They started with 20-mesh screens, but they were using 16 at the present time. One of their troubles at the present time was the copper in the ore in the metallic state, or as copper sulphite. If the tin was as reluctant to leave the ore as the copper, their extraction would be almost perfect. They were not in the same position as South Crofty respecting the extraction, but they hoped to get there with better ore, and which was very likely to happen, judging from the bottom of the mine.

DIFFERENT MINES—DIFFERENT PROBLEMS.

Mr. Jas. Rodda was of the opinion that different mines had their own problems to solve regarding crushing. Even a 14-mesh screen in some mines in Cornwall would be very fine because the tin was so rough that it did not require fine crushing. The figures presented were very interesting, and showed that improvement had been made in coarse crushing at Crofty, but he very much questioned whether that would happen in all the mines.

Mr. Caspell (St. Ives) contended that they could not say so much tin was actually lost. According to certain laws they were only entitled to recover so much tin. Morally, they were entitled to all, but legally they were only entitled to a part. Tin in most cases was in such a fine state that unless the particles were crushed before being allowed to escape they could not be liberated. He asked them to drop the words, "losses of tin," and to refer to it as trying to improve the extraction. Critics read of "Losses of tin in Cornwall," but they heard nothing of the losses of tin in the Straits and Northern Nigeria, and consequently speculators would refrain from having anything to do with Cornwall. They would never recover 100 per cent. An improvement could only be brought about by patient investigations, as the manager of South Crofty had shown, and the hearty co-operation of managers, mill men, and all connected with the industry.

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GOLD AND TIN INTERESTS OF THE "T.C.L."

Mr. H. C. Boyd's Detailed Review of Promising Outside "Propositions."

IN the course of his speech at the annual meeting of the Transvaal Consolidated Land and Exploration Company on Tuesday, referring to the mining interests of the company, Mr. H. C. Boyd said:—

As you see, the discovery of tin on the company's farms Mutaefides and Tygerpad—the result of these farms being thrown open to public prospecting—has led us to prospect our ground outside the discovery area granted. The prospect continues to look very promising; over 200 tons of high grade ore have been extracted, estimated to contain more than 50 tons of tin concentrates, and if it is possible to overcome the difficulty of water scarcity without heavy expense on a pumping scheme, we shall shortly erect a small plant on this property. Other farms belonging to us in this district are also being prospected. On Witfontein and Newburg, the south drive on the fissure at the 150 feet level, 124 feet long at date, appears to be coming into the profitable shoot encountered in the upper workings, the value of the last 5 feet of driving being 1·75 per cent. tin over a width of 60 inches. The north drive at the same level appears to have struck a new ore shoot after a stretch of barren ground, the last 4 feet showing 1·34 per cent. over 60 inches. The south drive at the 88 feet level has been driven 76 feet since the beginning of this year, all on a well-defined body of ore averaging 2·34 per cent. over 50 inches. A crosscut west from this drive averages 2·1 per cent. tin over 60 inches for 20 feet, and a winze sunk to connect with the 150 feet level at a depth of 35 feet shows an average value throughout of 6·8 per cent. tin over 40 inches, the value in the face at present being 28 per cent. over 40 inches.

ENCOURAGING PROSPECTS.

The erratic nature of this deposit makes an accurate forecast of ultimate results impossible, but Mr. Garrard considers the prospects encouraging. We have spent a considerable amount on this prospect without securing payable results, but from these figures, which I have purposely given in some detail, I think you will agree that we have no alternative but to continue this prospecting. On Welgevonden the tributing lease, regarding which negotiations were pending when the report was written, has been granted on the company's usual conditions. At Weynek we are considering the advisability of erecting a small plant to recover the tonnage already developed, provided the further development of Witfontein warrants the removal of the plant to that farm at a later date if further development at Weynek should not indicate sufficient additional tonnage to justify retaining the plant there. On the Zaaiplaats Lease the tin values located by diamond drilling, about 100 feet to the dip of the workings in No. 1 adit, have now been exposed. About 50 feet of winzing and raising show profitable ore similar to the deposit worked in No. 1 adit, which, as you will recollect, yielded ore which was milled last year at the Groenfontein battery and materially reduced the debit standing against the lease. At that adit, too, further exploratory work has revealed profitable ore in advance of the stope faces previously thought to be worked out. The Roodepoort tributing lease, which yielded satisfactory results to us, cannot at present be regarded as a material contributor to the Groenfontein mill. The profit of £9,704 made by the Groenfontein tin mine during 1912 has, as you have seen, been written off against the capital cost of the mine equipment, thereby reducing it at the close of the year to just over £31,000.

THIS YEAR'S MINING.

This year's mining has been almost entirely confined to opening out the tin deposits discovered by diamond drilling beneath the main pegmatite vein, and a definite scheme of development work is being carried out, on the results of which the future success of this property largely depends. So far this year, a loss of about £1,800 has been incurred, but against this the heavy cost of this essential development work and diamond drilling, together with various extensions of plant, has been met. As Mr. Garrard states in his report, and as I pointed out last year, with an erratic deposit of this nature it is quite impossible to forecast anything; all that can be said is that new disclosures of some importance are continually being made, while there is always a chance of again making a really valuable discovery. As evidence of this, the hydraulic stripping operations have recently uncovered what at present promises to be an important ore body. This has now been followed down into solid formation, where it is carrying 30 per cent. tin and dipping in the direction of, and underneath, the pegmatite. In appearance it is similar to that of No. 30 working, which was the next best producer after No. 9, which you may recollect produced £100,000 worth of tin. It is as yet, however, too early to entertain definite hopes of this discovery proving of permanent value. Some forty drill holes have been sunk by an "Empire" drill in the alluvial deposit, in the Zaaiplaats Valley, complete results from which are not yet to hand, but those so far received point to the existence of a tin-bearing wash, 10 to 15 feet thick, running along the valley some 45 feet below the surface. The average of 13 holes intersecting this wash shows the satisfactory value of 3·35lb. of tin per cubic yard over a thickness of 12 feet. Closer drilling and valuation of this wash will be made as soon as its general trend and limits are known, and a study of the nature of the overburden will also be made before deciding on the best method of recovering the tin.

INITIAL DIFFICULTIES.

The battery of Rietfontein (T.C.L.), Ltd., started in the middle of last year, but, as is recorded, many initial difficulties had to be contended with and very little profit was made. During the first five months of this year, 5,577 tons have been milled, at a profit of £2,346, making the total profit to that date just over £3,000. There has been no capital expenditure this year. The ore reserves, at 1st of June, were estimated to be 7,400 tons of an average value of 16 dwts. over the stoping width. Owing to the long distances between pay shoots in this mine, a great deal of driving through barren ground has to be done, and it is now proposed to push development more rapidly. It may be necessary to devote the bulk of the profits for some months to this work. The metallurgical treatment of the reef presents some difficulties, owing to the existence of bad patches of refractory ore, due to the presence of copper, but the general average is likely to be amenable to ordinary treatment. The plant of the Fairview (T.C.L.), Ltd., as mentioned in the report, proved to be unsuitable in some respects owing to the exceptionally flocculent nature of the slimes and additional tanks and zinc boxes have had to be installed. These should be ready at the end of this month, when it is expected that the percentage of recovery will be about 82 per cent., while the capacity of the plant will be somewhat increased. Milling operations have therefore been conducted under adverse conditions during the first five months of this year, but 6,095 tons have been milled, yielding 7·6 dwts. per ton, and showing a profit of £2,088. The ore reserves, at 1st June, were estimated at 24,500 tons, of an average value of 12·45 dwts. The general outlook of this small mine is satisfactory. It must be borne in mind that the mills of this company and Rietfontein (T.C.L.), having been erected after the Mines and Works Act of 1911 came into force, may not be run on Sundays. The company's interest in what is described as the Butterfly-Cecil Group (Rhodeisa) is being disposed of at a small loss, the results obtained having been disappointing. At the Marico Zinc Mines there has been considerable delay regarding the installation of concentrating plant, owing to the difficulty of deciding on a suitable type, but definite progress is now being made. Pending the erection of a plant, work underground has been curtailed, but prospecting is proceeding on certain promising indications apart from the existing development.

SWAZILAND TIN.

The expectations formed regarding the possibilities of the Swaziland Tin, Ltd., when the board decided to invest in its shares, are now being realised. The output has materially increased, having averaged about 42 tons per month for the last few months. The published profit for May was £4,400, the highest ever earned by the company. Mr. Garrard, as you see, has been appointed consulting engineer to the company, and on his recommendation electrically driven gravel pumps are being installed to take the place of the existing hydraulic elevators which consume a large amount of the high pressure water which would otherwise be available for breaking ground. It is anticipated that these pumps will be working at the end of this month, when, given normal water supply, profit should be further increased unless the price of metal should drop further. From advices just received it appears unlikely that this will occur. The company has just declared a dividend of 20 per cent. for the current half-year. We are at present engaged in making certain investigations in the Barberton district, on the recommendation of our technical advisers, but it is too early to attempt to deal with this in any detail; it will be sufficient to say that we have secured rights over a very considerable area of ground, which is now being examined. I cannot close without recording the board's appreciation of the work of the company's chief officials and staff generally; in a company of this nature the work grows more onerous each year, and there is invariably an ungrudging response to all demands made on them. I now beg to move the adoption of the reports and accounts for the year ended the 31st of December, 1913.

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IMPROVING POSITION OF THE ROBINSON DEEP.

Prospects for the Present Year—The Booysens Estate Claims.

Mr. F. D. P. Chaplin presided at the annual meeting of the Robinson Deep last week, and after reviewing the balance sheet and accounts in detail for the year, went on to say:—

The latest re-estimation of the ore reserves shows that at 31st March last the fully developed payable ore amounted to 1,538,000 mine tons, of an average mine grade of 6 dwts., together with some 346,000 mine tons of partially developed ore indicating an average mine grade of 5·88 dwts. This compares with the last year's estimate of 1,141,000 payable milling tons of an average assay value of 7 dwts., the actual value per ton being about the same, but, in view of the possibility of discrepancies, arising partly from unavoidable errors and from variations in the amount of sorting done from time to time, it is considered advisable to record the tonnage and value over a stoping width instead of over a milling width as formerly. I should mention that the above estimate does not include any tonnages or values of the ore in the water-right area. During the current year, assuming there is a sufficient supply of native labour to enable us to keep the tonnage crushed at about 65,000 tons per month, and provided no unforeseen accidents occur, there seems no reason why an average monthly profit of £30,000 should not be realised. Two points, however, must not be overlooked. First, at the present time some 7,500 tons per month is being milled from ore belonging to the richer water-right area, which is becoming congested and less accessible, and it is probable that after August it will be practicable to take only about half that quantity from that area. Secondly, as the manager's report indicates, this is a mine in which some of the ground is of a decidedly treacherous nature and the expense of keeping working places safe is considerable. During the year under review as much as £3,000 per month, on an average, was spent on this work, which it is obvious cannot possibly be neglected even if a still higher expenditure becomes necessary. In this connection it should be stated that considerable benefit is likely to be derived from sandfilling of the underground workings, which is about to be practised on an extended scale. During the year the company has been called on to pay, under the Miners' Phthisis Acts of 1911 and 1912 and towards the maintenance of the Miners' Phthisis Sanatorium, a sum of £8,542. In addition, there has been spent during the year, on the improvement of ventilation and dust allaying, £6,478; making a total expenditure in this connection during the financial year of £15,020. You will, I think, agree that the amounts spent on the improvement of ventilation and dust allaying affords evidence that this company at any rate is not unmindful of its obligations in this respect; and it is satisfactory to find that the last report of the Miners' Phthisis Prevention Committee shows that on the Rand generally very satisfactory progress has been made in the allaying of dust in the mines. As I have already stated, we have of late had the benefit of an improved supply of native labour, the average number available during the last six months of the financial year having been 3,569 as against 3,150 for the corresponding period of the previous year. On this mine special efforts, attended with a good deal of success, have been made to become less dependent on hand labour and to extend the use of small machines. In dealing, however, with a large tonnage such as ours, it is hardly possible to overrate the importance of an adequate labour force. Owing to the formation of the Native Recruiting Corporation and the consequent decrease of competition, a much needed check has been given to the upward movement of recruiting costs. This company has not at any time employed any appreciable number of the so-called tropical natives, but it will, of course, like all other companies, suffer to some extent from the reduction in the total labour force of the industry caused by the recent decision of the Government to prohibit further recruiting of these natives. At the present time we are suffering to some extent from the exodus of natives from the Rand usual at this time of the year, and the number in the company's compound at the 31st of May last was 4,060 or 78·7 per cent. of our complement. As you were informed last year, your directors have had under consideration for some time past the acquisition of certain claims situated on Booysens Estate, adjoining the company's southern property but north of what is known as the Grahamstown dyke. The exact number of these claims cannot be accurately determined till the position of the dyke is definitely located. The acquisition of these claims would prolong the life of your mine considerably, a consideration to which each year of working adds increased importance, and, as I said last year, the present equipment and shafts, the incline of one of which has already entered this ground, would enable the ore from this area to be extracted economically. Up to the present, however, the terms on which the claims can be acquired have not been arranged, and, before any definite agreement is entered into, the shareholders will be given an opportunity of considering the proposal fully. During the year under review the mine has again been in charge of Mr. J. J. Wessels, and your directors have much pleasure in placing on record their appreciation of the work done by him and his staff and the employees generally. The directors' report and statement of accounts were adopted.

Rhodesian May Output.

The gold output for May has been declared at 57,866 ounces, valued at £242,452, an increase on the preceding month of 571 ounces, value £1,351. Other minerals are silver, 11,030 ounces, value £1,529; coal, 19,685 tons; lead, 36 tons; chrome ore, 3,747 tons, value £8,361; diamonds, $102\frac{3}{4}$ carats, value £810.

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MINING MEN AND MATTERS.

Mr. Wm. Calder has been elected President of the S.A. Institution of Engineers for the coming year.

* * * *

Mr. G. T. Cousins, manager of the Ingersoll Rand Co., left on a six months' holiday trip to America by this week's Imperial mail. During a little over two years' residence in Johannesburg Mr. and Mrs. Cousins have made a large circle of friends.

* * * *

The death occurred this week of Mr. C. J. H. Roberts, of Port St. John's. Deceased was the discoverer of the Roberts Victor Diamond Mine, which was situated on his uncle's farm, and he was a life director on the board of the company.

* * * *

The S.A. Institution of Engineers has awarded its gold medal to Mr. R. C. Warriner for his paper on centralization at the Crown Mines. The paper by Mr. G. K. Chambers on the Braking of High-Speed Winding Engines was the "runner-up."

* * * *

The management of the Victoria Falls and Transvaal Power Company and the Union Steel Corporation of South Africa having extended a cordial invitation to the members of the South African Institute of Electrical Engineers to visit their respective works at Vereeniging, the Council has made arrangements for the visit to take place to-day.

* * * *

The new officers of the Chemical, Metallurgical and Mining Society are as follows:—President, Mr. Alex. Richardson; vice-presidents, Prof. G. H. Stanley, Mr. H. A. White, Mr. J. E. Thomas; hon. treasurer, Mr. J. Littlejohn (unopposed); members of Council, Mr. K. L. Graham, Prof. J. A. Wilkinson, Messrs. J. Gray, F. W. Watson, C. Toombs, T. Donaldson, A. Whitby, A. Salkinson, E. Pam, F. Wartenweiler, John Watson, H. Meyer.

* * * *

At the annual meeting of the Chemical, Metallurgical and Mining Society, the chairman reported as follows with reference to the students' prizes: For the best paper submitted in chemistry, metallurgy or mining, a prize to the value of ten guineas was offered by the Council. It has been decided, after due consideration, to divide the prize between Mr. L. D. Hingle for his paper on "Electrolytic Zinc," and Mr. F. D. Long for his paper entitled "Observations during a month's stay on the Brakpan Mines Reduction Works." For the best contribution submitted by a student to the discussion of any paper, it has been resolved to award the prize of three guineas to Mr. B. C. Smith for his contribution to the discussion of Mr. J. M. McNeill's paper on the "Recovery of Black Sand." For the prize of twenty guineas offered by the Witwatersrand Co-operative Smelting Works, Ltd., for a method of determining gold in the presence of iridium and allied metals, thirteen papers were submitted. It has been decided to divide the prize between two competitors, Mr. C. Toombs and Mr. James Gray, F.I.C.

* * * *

The next monthly meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 30th June, 1913, at 8.15 p.m. The following papers will be open for discussion:—"Note on the Origin of the Iridosmine in the Banket," by R. B. Young, M.A., D.Sc. (Edin.); "Structural Features of the Western Witwatersrand," by E. T. Mellor, D.Sc. (Lond.); "Notes on the Sea-Point Granite-Slate Contact," by E. H. L. Schwarz, A.R.C.S.; "Note on Diamonds in the Banket," by R. B. Young, M.A., D.Sc. (Edin.); "Notes on a Section from Barberton to the Komati River," by David Draper (hon. member). The following papers will be read:—"The Bushman's River Cretaceous Rocks," by E. H. L. Schwarz, A.R.C.S.; "The Geology of Katanga and Northern Rhodesia—an Outline of the Geology of South Central Africa," by F. E. Studt, A.R.C.S.

Outside Districts.

S.W. Diamond Fields.

The output of diamonds from 38 different sources scattered throughout the South-Western Transvaal shows a total far in excess of that of any previous month. The total is 9,355⅜ carats value £58,472 3s., and in comparison with this total may be mentioned that the best previous month on record was March with 8,917¾ carats value £49,805 19s. 6d. It will be noted that many of the older and well-known diggings showed up much better than in April, while the total was also augmented by the returns from a number of the newer localities where prospecting is being carried on. A summary of the returns is as follows:—

	Carats.	Value.		
Bloemhof	1,940⅞	£11,952	19	0
Koppiesvlei	1,451	7,768	0	0
Dievedraai	937¾	6,016	11	6
Eastleigh	718¼	5,183	10	0
London	882	5,169	0	0
Rietput	605½	5,167	10	0
Avondster	599¾	3,178	7	6
Panfontein	324¼	2,117	1	0
Mooifontein	307½	1,772	7	6
Maroetjesfontein ...	203¼	1,635	1	0
Goedgenoeg	209	1,559	2	6
Olievenfontein	258¾	1,332	12	6
Zwartlaagte	126¼	775	1	0
Christiana	110	657	14	0
Modderkraal	83¾	648	17	6
Kameelkuil	81¾	525	10	0
Biesjeslaagte	45¼	371	0	0
Eerstebegin	52	345	0	0
Grootdoorns	77¼	315	15	0
Kuilfontein	63½	283	10	0
Schaapboschdraai ...	35¼	282	10	0
Schweizer-Reneke ...	43¾	245	0	0
Vuurfontein	37½	214	0	0
Blesbokfontein	33¼	204	2	0
Koppiesfontein	23¾	182	0	0
Krommellenboog ...	24¾	167	5	0
Diamantdoorns ...	16½	108	10	0
Weltevreden	25½	101	0	0
Johannesrust	11¼	71	0	0
Zevenfontein	9¼	44	10	0
Zoutpan	3¼	18	0	0
Mamusa	2½	17	0	0
Amsterdam	3	17	0	0
Middlebosch	4½	10	0	0
Doornbult	1½	6	5	0
Schoongezicht	1¼	5	0	0
Van Zyl's Drift	¾	3	0	0
Klipspruit	½	1	10	0
	9,355⅜	£58,472	3	0

The returns for the first five months of the year have been as follows:—January, 7,105 carats, value £40,381 1s.; February, 7,695⅜ carats, value £43,063 6s.; March, 8,917¾ carats, value £49,805 19s. 6d.; April, 7,416 carats, value £42,951 9s. 9d.; May, 9,355⅜ carats, value £58,472 3s.; total, 40,489½ carats, value £234,673 19s. 3d.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Diamonds in Banket.

To the Editor, *South African Mining Journal.*

Sir,—I have been very much interested in your articles on the above subject, which appeared in your valuable journal. May I add, for the benefit of your many readers, the following few facts. The existence of diamonds in the Witwatersrand bankets was known as far back as '85. This discovery was made by the late W. P. Prosser, F.R.S., during his early geological survey and investigations on the Klerksdorp series, when he found several small diamonds of light green colour embedded amongst the pebbles. During or about the year '97 this occurrence was common on the property of the Klerksdorp Gold and Diamond Company, then under the management of Mr. P. O. Wilson, and several diamonds were taken from time to time out of the mortar boxes. Several of the above stones are still in existence and can be seen in the museums of the Cambourne and Royal School of Mines. Further, about '98 a small ¾ carat dark olive green stone was found by me in the old Chimes mine, Benoni, which is still in my possession, along with some seed pearls found in the New Kleinfontein vlei. If I am not mistaken, Professor Prosser came to the same conclusion as Professor Young as regards how these gems came to be deposited in the banket.—Yours, etc.,

K. C. G. KINLOCH.

Melmoth, Zululand,
18th June, 1913.

Central Diamond Syndicate and the Public.

To the Editor, *South African Mining Journal.*

Sir,—I shall be glad if you will please publish the following:—It is now some considerable time since the Central Diamonds Syndicate was floated, but nothing has ever been published as to the work done by, or the intentions of, the Syndicate. It is only fair that investors, after they have parted with large sums of money to those persons who are responsible for the birth of the syndicate, should be told what they might expect to receive; but it would seem now that the directors have secured heavy premiums on the shares they disposed of, that they do not consider they have any moral responsibility in the matter. As a shareholder, and an extensive one at that, I consider that it is up to the directors to state what work has been done, and what is the future programme, or will they state whether the syndicate is defunct altogether. Perhaps it is too much to expect that such exalted personages would condescend to reply in the public Press, but it is hoped that this letter will, at least, call attention to the position.—Yours, etc.,

SHAREHOLDER.

Johannesburg,
26th June, 1913.

Miners' Phthisis Prevention Committee.

To the Editor, *South African Mining Journal.*

Sir,—In your to-day's issue in your article entitled "The Fight against Miners' Phthisis," where you give an extract from the third report of my Committee, regarding tuberculosis, you state: "Of the surface specimens, about 2·5 per cent. have been found to contain the bacillus, and of the underground specimens *the same number* have been found *to be* similarly infected." This is not correct, as the words italicised do not appear in my Committee's report and are misleading. The correct wording is: "Of the surface specimens, about 2·5 per cent. have been found to contain the bacillus; and of the underground specimens, *about* 15 *per cent.* have been found similarly infected." This conveys quite a different meaning, you will see, and as the Minister's speech will no doubt be widely read, and as the extract is correctly reported by the Capetown newspapers, your report is liable to create misunderstanding in the minds of those who read it. Will you kindly therefore publish in your next issue the necessary correction? Thanking you in anticipation.—Yours, etc.,

A. SPICER,
Secretary.

P.O. Box 149, Johannesburg,
21st June, 1913.

Main Reef West.

The provision for debenture interest and redemption and current capital expenditure, etc., has practically absorbed the profit made during the current half year, consequently no dividend can be declared.

Blaauwbosch Diamonds.

Quarterly dividends are now being announced by Blaauwbosch Diamonds with unfailing regularity. Following upon a disbursement of 4s. a share, announced in March, the directors recently declared another quarterly dividend at the same rate. The company's production has been sold by contract for a number of years to come, and while, under this agreement, it enjoys a half-share of realised profits, it is immune from any losses.

INVESTORS' DIARY.

The following company meetings have been announced:—

July 4.—General Mining and Finance Corporation.
July 31.—Glynn's Lydenburg (Special).
Aug. 5.—City Deep.
Aug. 26.—Glynn's Lydenburg (Special).
Aug. 26.—Transvaal Gold Mining Estates (special).
Sept. 19.—Transvaal Gold Mining Estates (special).

AMUSEMENTS.

NEXT WEEK'S PROGRAMME

His Majesty's: Holloway Company	8.15
Standard: Quinlan Opera Company	See bills.
Empire	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

Rhodesian Section.

LATEST MINING NEWS.

The Jumbo Mine—Shamva Railway.—The Lemberg—Cam and Motor Wood Contract—Eldorado Dividend—Rezende Mines—Tanganyika Concessions—The "Lonrho" Co.

The news from the Jumbo continues to be of a disappointing nature. On the output for April (£4,086 from 3,100 tons crushed) the loss is officially reported at £370, and it is noted that the return included £212 won by treating 250 tons of rock from the Commonwealth mine. The redemption of mine development is now being taken at the high, though probably very necessary, figure of 10s. per ton.

* * * *

The railway from Mazoe to Shamva, to connect the Shamva gold field at Abercorn with Salisbury and the Rhodesia, Mashonaland and Beira railway systems, has been completed and opened to traffic. The line is constructed on the standard South African 3ft. 6in. gauge, and, including the sidings, it is about 50½ miles in length. It is constructed with 60lb. rails and steel sleepers. The sharpest curve is eight chains in radius, and the steepest gradient is 1 in 50 for 2½ miles, while the deepest cuttings and the highest banks are 15ft. 6in. and 13ft. 6in. respectively. The work has necessitated the construction of 24 plate girder bridges varying from 6ft. to 20ft. in span, and one of 75ft. span, in addition to a lattice girder bridge of 100ft. span. Over 90 culverts from 2ft. to 4ft. in diameter have been built. Stations have been provided at Concession Siding, Glendale, Mazoe River, Pimento Park, Kimberley Reefs and Shamva. The work, which was completed in about ten months, has been carried out by Messrs. Pauling & Co., Ltd., under the supervision of Messrs. Sir Douglas Fox and Partners and Sir Charles Metcalfe, consulting engineers to the Blinkwater Railway Company, for whom the line has been built. Mr. S. F. Townsend acted as resident engineer.

* * * *

The Lemberg mine, which is reported to have been taken up by a syndicate, is situated about a mile to the south of the Thistle-Etna and near the Mombi river. It belongs to Mr. A. C. Bentley, now of Shamva, and the estate of the late Mr. "Jimmy" Hills, who was accidentally shot last Christmas Day at Shepherds Reefs. It consists of four blocks—the Lemberg, Lemberg No. 1, Lemberg No. 2 and a fourth. The Lemberg is separated from Lemberg No. 1 by the Rosebank block belonging to the Mayo Rhodesia Development Syndicate, and the fourth Lemberg block is double banked with the Rosebank block. On the Lemberg, there is a shaft down 110 ft. and a drive therefrom at the bottom of 40 ft. The reef averages 22 inches. On Lemberg No. 1 there is a trench 180 ft. long exposing a considerable quantity of rubble said to average over 6 dwts., and in this trench there is a reef about 20 inches wide, on which a 35 ft. shaft has been sunk. The reef outcrops on Lemberg No. 1 and 2 and there are several old workings as well. In April, 1912, there was a trial crushing of 120 tons of ore—it was inadvertently returned as 100 tons—and the return was 29 ozs., equal to 5 dwts. per ton, value £122. The trial crushing was reef and rubble combined.

* * * *

It is interesting to note that the line being laid from the Cam and Motor to the area where the contractors (Drayton Brothers) are cutting wood for the mine, is not to be an ordinary tram line, but the old narrow gauge railway that has been taken up on the Eldorado line. The locomotives and trucks will also be used for the transport of the wood. When this wood contract is finished, the railway would be very useful if it were relaid from Gatooma to Golden Valley, and ultimately on to Shagari.

We have been notified that cabled advice has been received from the London office of the Eldorado Banket G.M. Co., Ltd., to the effect that an interim dividend of 15 per cent. has been declared, which is payable to shareholders on the 30th June next.

* * * *

The report of Rezende Mines for 1912 states that during the year 1912, 257 mining claims and three farms were taken over from the Penhalonga Mines, Limited, together with buildings, plant, etc., against the issue of 17,932 fully paid Rezende shares, making the total issued capital £118,435. The property now consists of 653 claims and three farms. The net working revenue was £24,987, including £8,976 derived from the Penhalonga section since its absorption on May 10, 1912, whilst £5,785 received from tributors raised the working profit to £30,772. Deducting £1,276 for London expenses, £1,727 for depreciation, and £6,060 for development reserve, there remains a credit balance of £22,247 which, with sum brought in, makes a total of £44,672 to appropriation account. An interim dividend of 1s. 6d. per share was declared in December, and a balance profit of £35,345 was carried into the balance sheet. The directors now recommend a balance dividend of 7½ per cent. (1s. 6d. per share), making 15 per cent. for the year. The cost of the shafts, viz., £15,799, has been entirely written off, leaving a balance on share premium account of £12,004. The balance sheet shows that mine development, after extinction of the costs of the shafts, stands at £28,777. Against this item the ore reserves amounted on December 31 to 221,095 tons, being 145,599 tons in the Rezende and 75,496 tons in the Penhalonga section. Of the Rezende ore reserves 101,579 tons were estimated at an average of 7·38 dwts. The total working profit increased from £15,544 to £30,772, which was due to the larger tonnage milled and higher grade of ore, to additional income from tributors, and to the profits from the Penhalonga section. Both sections milled 94,613 tons for a recovery of 26,482 ozs. of gold, 60,604 ozs. of silver, and 355 tons of lead. The total gross revenue from Rezende was £76,525 or 30s. 11·9d. per ton, and from Penhalonga £49,843 or 22s. 0·4d. per ton, the total working costs being respectively 24s. 6·1d. and 18s. 0·8d. The balance sheet shows net cash assets, including debts since collected, after providing for all creditors and the interim dividend, amounting to £41,946, of which £6,060 is earmarked for development reserve account.

* * * *

The report of Tanganyika Concessions for the year ended September 30th states that notwithstanding the disturbed political and financial outlook and the consequent depression in markets during the period under review, the directors have been able to meet all the company's commitments, including Debenture interest. Arrangements have already been made to meet the coupons payable in July and January next. Two furnaces with a capacity for treating over 4,000 tons of ore a month have now been built at Lubumbashi, and it is expected that they will both be running about the end of June. Further extensions are already under consideration by the Union Miniere du Haut Katanga. That company has entered the profit earning stage. This fact, taken together with the improved results obtained from the railways in which the company is largely interested, makes the question of meeting the commitments of the company an easier problem each year. At the annual meeting of the Union Miniere du Haut Katanga, held in December last, Mr. Jadot dealt very fully with the results of the smelting operations to that date. Since then smelting has been continued with one furnace by using Wankie coke with satisfactory and much improved results. The Wankie coke, which has now replaced English fuel, effects a saving of about £7 per ton of coke, and when the coke ovens which the Union Miniere du Haut Katanga are now erecting at Lubumbashi are completed, the cost will be still further reduced. Down to April 30th last 4,900 tons of copper had been produced. Smelting at the Kansanshi mine was carried out between June and November, 1912, with the small furnace at that mine, and resulted in 401 tons of copper being produced. Pumping and concentrating plant is being shipped, and it is expected that when this is erected a good output of copper from Kansanshi will be obtained. A total of 2,474 tons of copper has been obtained from this mine and shipped to Europe since the commencement of smelting operations. The balance of receipts over expenditure in working the Benguella Railway in 1911 was £17,193, and in 1912 it was £23,292. Since the beginning of 1913 there has been a steady increase in the receipts. The year's receipts of the Rhodesia-Katanga Junction Railway and Mineral Company show a balance over expenditure of £40,840, and from October to March, 1913, the date of the last returns received, the balance for those six months amounted to £26,623. Prospecting work for diamonds is still being carried on by the Kundelungu Committee with a view of exploiting the area in which the Tanganyika Company's prospectors originally discovered the eight "pipes." The work carried out has been chiefly confined to one of these "pipes," viz., Luanza, where 150 small diamonds have been found.

* * * *

The London and Rhodesian Mining and Land Company, Limited, have taken a two years' option on the Koodoo claims. This property lies between the Radnor and Kelly's. Development to date on the Koodoo has so far proved the lode for a distance of 400 ft., on the first level the average grade of the ore being approximately 9 dwts. over a width of 5 ft. Work has now been started to prove the further extension of the shute in length, and at the same time its downward continuation. Radnor claims: Shaft No. 1 sunk a further 22 ft., total 183 ft.; winze at 78 ft. west of No. 1 shaft sunk a further 5 ft., total 41 ft.; assays for distance sunk, 37 dwts. over 62 ins. Kelly's Option: East drive from shaft No. 2 driven a further 50 ft., assaying 3 dwts. 12 grs. per ton over 67 ins. West drive driven a further 62 ft.; last 20 ft. averaging 23 dwts. over 61 ins. Value still in both faces.

RHODESIA'S LEADING GOLD MINES.

Gold Output and Dividends—Figures for Forty Mines.

We take the following interesting table from the eighteenth annual report of the Rhodesia Chamber of Mines. It constitutes an analysis of gold produced and dividends declared by the principal mines of Southern Rhodesia in 1912, and sets forth in concise form the salient features of production in connection with the forty chief gold mines of Charterland last year.

Mine or Company.	Ton Milled 2,000lbs. to the Ton.	No. of Stamps at Work.	Mills other than Stamps.	Yield and Value of Gold. Value of Yield from All Sources.	Yield and Value of Gold. Value per Ton.	Dividends Declared Rate per Cent.	Dividends Declared Amount Distributed
Agincourt	5,446	5	—	18,333	67.32	—	—
Alice and Atlas	13,330	10	2 Chilians	30,242	34.90	—	—
Battlefields (Rhod.), Ltd.	17,328	—	—	14,065	21.10	—	—
Berwick	1,705	6	1 Pan	10,524	123.44	—	—
Brilliant	5,914	5	—	21,629	73.14	—	—
Bucks Reef Gold Mines, Ltd.	9,732	5	—	23,934	49.18	—	—
Bushtick Mines, Ltd.	43,002	20	1 Tube	37,878	17.61	—	—
C	24,071	10	1 Chilian	21,066	17.50	—	—
Claremont Mines (Rhod.), Ltd.	29,980	20	—	35,865	23.82	—	—
Concession and West Ext.	26,475	5	1 Chilian, 2 Pans	29,739	22.46	—	—
Csardas	6,310	10	—	22,580	71.57	—	—
Eiffel Blue and East Ext.	15,670	10	—	32,492	41.47	—	—
Eldorado Banket G.M. Co., Ltd.	87,346	20	2 Chilians, 8 Pans	225,409	51.61	30	90,000
Gaika G.M. Co., Ltd.	34,562	5	1 Chilian	61,941	35.84	5	13,675
Giant Mines of Rhodesia, Ltd.	130,513	30	2 Tubes	205,257	31.45	32½	84,943
Glencairn No. 3	4,665	4	—	17,222	74.02	—	—
Globe and Phœnix G.M. Co., Ltd.	72,923	40	10 Pans	476,584	130.70	110	220,000
Hay G.M. Co., Ltd.	19,100	10	1 Tube	27,873	28.66	—	—
Jumbo G.M. Co., Ltd.	36,620	30	—	59,604	32.55	—	—
Kanyemba	3,869	5	—	19,798	102.34	—	—
Lonely Reef G.M. Co., Ltd.	37,655	15	3 Tubes	158,841	84.36	30	81,300
Matabele 3	9,658	10	—	20,197	41.82	—	—
Matabele Queens Co., Ltd.	16,517	10	—	37,769	45.73	—	—
New Eclipse	7,365	5	—	14,465	39.28	—	—
North Bonsor	16,819	15	—	16,068	19.10	—	—
Northern Star No. 2	9,011	10	—	16,230	36.02	—	—
Old Nic	18,466	15	4 Pans	35,547	38.49	5	8,190
Owl	14,790	10	—	32,463	43.89	—	—
Penhalonga Mines, Ltd.	42,200	50	—	32,748	15.52	—	—
Pickstone	4,826	4	—	31,422	130.21	7½	3.750
Rezende Mines, Ltd.	28,080	35	—	42,709	30.41	—	—
Rezende-Penhalonga	49,700	85	—	55,570	22.36	7½	8,881
Rezende I.W.A. & D.B. 2	42,564	10	—	20,482	9.62	—	—
Selukwe Columbia G.M., Ltd.	33,613	—	1 Chilian, 3 Pans	66,174	39.37	—	—
Shepherds	8,110	6	—	27,794	68.54	—	—
Susanna Mines, Ltd.	9,184	8	—	26,886	58.54	7½	2,437
Thistle-Etna G.M., Ltd.	7,300	—	1 Chilian	12,111	33.18	—	—
Tuff Nut	6,979	5	—	22,096	61.75	—	—
Wanderer (Selukwe) G.M., Ltd.	222,200	—	4 Gates Rolls	86,977	7.82	—	—
Washington	4,611	5	—	18,009	78.11	—	—

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Engineering Notes and News.

Mining Machinery Exhibition.

SOME LEADING EXHIBITS.

This Exhibition was opened on May 29, at the Agricultural Hall, London, by the Earl of Ellesmere. The following are some of the most prominent exhibits:—

The Hardy Patent Pick Co., Limited,

have the following exhibits: A patent "Hardy-Simplex" hand-held air hammer drill, with twisted drill steels for coal, stone, etc., for heading, and hollow drills steels for sinking; a patent "Hardy-Simplex" complete, with automatic feeding device for heading, driving, ripping, stoping, etc.; "Simplex" boring bars and dust allaying sprays. The "Hardy" coal-cutting machines are of various sizes for undercutting and shearing. There is a large selection of hand-power boring machines, miners' picks, wedges, hammers, shovels and general contractors', miners', and quarrymen's tools; safety bar hook for haulage purposes; No. 2 "Devil" machine, for grinding, with improved self-oiling ring bearings; a propulsion swinging conveyor trough in motion; and sections of their patent "Elliott" coal washer troughs, of the latest types and models, plans, etc., of modern colliery surface plants recently erected by this firm.

Edgar Allen & Co., Limited,

show section of plate picking belt; creeper chain for colliery use; gravity buckets with tipping arrangement; jaw crusher fitted with jaws of manganese steel, made in all sizes, 9 ins. by 5 ins. to 30 ins. by 18 ins., for crushing all classes of ores, etc.; dredger bucket with bushes, lips and shoes of manganese steel; ball mill, suitable for grinding shale for making dust for sprinkling in mines; forged steel balls, for use in ball and other grinding machines; crusher jaws in Allen's manganese steel, made to suit all types of crushers; chain in manganese steel, for elevators and conveyors; case of sample tool and mining steel, etc. Two pairs of manganese steel wheels and axles, and two pairs of ordinary steel wheels and axles.

The Ingersoll-Rand Co.

This exhibit comprises (1) 12 in. and 7½ in. by 12 in. "Imperial" class "XB-2" air compressor, with compound air cylinders, arranged for short belt drive, with unloader and special atmospheric unloader; to this compressor will be connected an air receiver; (2) 2½ in. by 3 in. type "XII." compressors, such as is used in garages and for blowing out dynamos and power stations; also a 3½ in. by 4 in. and a 4½ in. by 5 in. type "XII." compressor; (3) hand-power Davis calyx diamondless core drill outfit, with its regular equipment; (4) Temple-Ingersoll electric-air "Radialaxe" coal-cutting machine, with pulsator, motor, and all equipment. "F-92" air-radialaxe coal-cutting machine with its equipment. Included on the stand is a rock-drill such as used for submarine drilling, having a cylinder 6½ in. diameter—the largest size of percussive rock-drill built.

The Wilfley Mining Machinery Co., Limited,

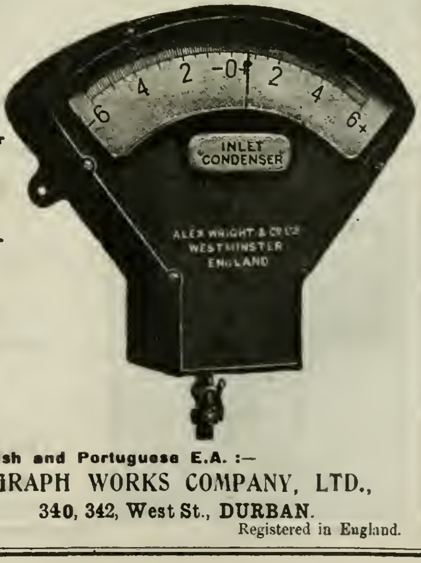
exhibit: (1) A No. 6 Wilfley patent concentrating table; (2) samples of spiral rivetted steel pipe; (3) a 6 ft. diameter by 22 in. cylindrical band Hardinge conical mill for primary or secondary reduction of ores and similar materials of every kind.

Head, Wrightson & Co., Limited,

show one unit "Nota Nos" patent coal washer, complete with feed elevator, pump, and necessary piping. This machine with slight modification is adaptable for washing pan ash, coke, etc. The machine shows the well-known Marcus horizontal motion, but the vertical Marcus motion, which is a new application, is shown for the first time. The result is that all perforations are absolutely cleared, and there can be no sticking of lumps in the holes, nor clogging up owing to dampness. This machine can classify either before washing or after. There are also working models of Marcus conveyor and a "Nissen" 4-stamp battery.

Geo. Cradock & Co., Limited.

Reels containing samples of new and worn wire ropes. Quality of loose samples of new and worn wire ropes for all purposes. Samples of mining steel, nickel and file steel. Samples of wire and wire rods. Various attachments for wire ropes. Overtub and undertub rope haulage clips.



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The "Kimber" chisel bit sharpening machine. This labour-saving machine is designed for sharpening or for making chisel bits. The drills are uniform in shape; they can be made to any practicable size, and the cutting edge made to any angle to drill hard or soft rock. The drill after being sharpened retains its cutting edge equal to a drill sharpened by hand. The pneumatic hammer is actuated by and attached to the machine itself, and does not require a separate compressor; after a worn drill has been pared by means of the cutters, this device rapidly hammers up the extreme edge of the bit, and generally improves the lasting qualities of the drills. With this machine one man is capable of sharpening 250 drills per hour. A coal furnace capable of heating sufficient drills to keep the machine going is also supplied with each machine; the furnace being better adapted for heating drills than using blacksmiths' forges and more economical with fuel.

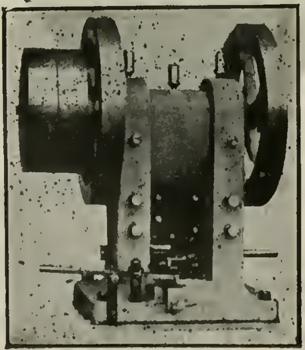
Messrs. Bleichert's Exhibit.

Among the exhibits of Bleichert's Aerial Transporters, Limited, a working automatic telpher on four supports in full size is worthy of special notice. The telpher car runs backwards and forwards on a rail 40 feet long and is controlled by a contact lever from any desired point. On arrival at the front end of the rail it lowers the skip, for which a loaded one is substituted. The latter is then hoisted and conveyed to the unloading station, where it tips its contents and returns automatically to the loading point. Here it stops until the man in charge again puts on the current, when the skip will again be hoisted. More than 300 of such telphers have been installed in Europe and the English Colonies, and in no case need the cars be accompanied by an operator, the traffic being entirely automatic. If the track can be laid in an enclosed circuit, so that the cars can follow successively at short intervals, capacities of any desired height can be got with a plant of this class. In the foreground of this stand is a working model of a wire ropeway, which demonstrates how ropeway cars can be loaded at one end, and then pass over the most difficult ground to unload at the other end. Such ropeways have been installed in recent times to a far greater extent than formerly. Views are given of a plant built for the Powell Duffryn Steam Coal Co., Ltd., on which the Bleichert patent coupling apparatus is employed, permitting with equal facility the negotiation of curves to the right and left of varying gradients. The line handles refuse and rubbish, which it automatically tips on to the dump, the cars then returning round the return sheave, and through the angle station, to the loading point, without any attendance on the open track. For high capacities and heavy single loads as frequently found on ropeways in modern times four-wheeled carriages in accordance with the Bleichert patent are adopted for the purpose of saving the carrying ropes by reducing the wheel pressure. Measures are adopted to enable the heavy pit-tubs, which weigh about 2½ tons each, to be pushed on and withdrawn practically automatically, so that one man suffices for the attendance at the loading and unloading stations, which are located at the shaft and works respectively. A Bleichert four-wheeled carriage in natural size, mounted on a trestle, is shown at the side of the exhibition stand. These cars will carry single loads up to 2 tons weight. A Bleichert telpher-car for the transport of rubbish, broken stone and gravel is also exhibited, which in contrast to the working telpher line, has no winch mechanism. A relief model of the steepest track in the world is also among the exhibits. This is a Bleichert wire ropeway for an hourly traffic of 10 tons of timber and agricultural produce to the lowlands over a distance of 5½ miles with a fall of 5,000 feet, the heaviest gradient on the line amounting to 41° = 81 per cent. The line is also used for passenger traffic. This relief model shows very graphically how simply the greatest imaginable difficulties can be overcome by means of a wire ropeway. On the walls of the stand in the Exhibition are noticed a number of photographs, among which may be noted the plants erected for the Wigan Coal and Iron Co., the automatic dump piling plant for the Brakpan Gold Mines, and a similar installation for the Great Boulder Mine in Australia. A picture of the telpher plant for the Randfontein Gold Mine is also on view and many other plants used in mining operations both in England and the English Colonies, giving evidence of the manifold uses to which the Bleichert Aerial Transporters can be put.

* * * *

We have received from Messrs. David Bridge & Co. a copy of their new C. 12 catalogue on friction clutches, mill gearing and haulages, and we note that they will be pleased to send a copy to any applicants. The special feature of the catalogue is the number of small illustrations of various clutch and gearing installations constructed from photos taken in the works, which should prove of great assistance in the arrangements of difficult drives.

M. Peter, a Swiss mountain railway expert, has forwarded plans of two schemes for running a railway to the summit of Table Mountain. The first provides for a funicular line up the Platteklip Gorge, which cuts into the front of the mountain. The second provides for a rack and pinion railway from Kloof Nek, on the Camp's Bay side. The latter would involve much more tunnelling.



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Chisel Jumpers up to 1¾in. guage sharpened at the rate of 4,000 a day.
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THE WEEK IN THE SHAREMARKET.

Firm but Quiet—Dividends Create Good Impression—Improving Outlook.

THE market remains firm but quiet, the effect of strike and Balkan news being offset by the dividend declarations. Should the strike die of inanition next week and the Balkan business resolve itself into another mere isolated " scrap," a general improvement is bound to be seen. The dividends are generally regarded as most satisfactory, and should create an excellent impression in London, where the financial counters have lately had nothing better to write than platitudinous advice and vague counsels of perfection to Rand directors. These people seem congenitally unable to understand (a) that mining shares are inherently speculative, (b) that no mining industry in the world gives as much detailed and prompt information to its shareholders as that of the Rand, and (c) that for the half dozen Rand stocks that have dropped notably in price in recent years, twice that number have enjoyed sensational rises. Besides, it is obviously unfair to compare quotations at a time when strikes, wars and an unexampled financial stringency have artificially depressed prices. The rest of the Rand dividends have yet to be announced, and interest is naturally being taken in the decision that may be come to by the mining companies affected by the strike. Tin stocks have been easier in keeping with the general market; and Zaaiplaats have been largely dealt in at reduced prices. Among diamond shares, Crowns and Frank Smiths have been in growing demand, as the date draws near when washing results may be announced. Should estimates be realized, both shares are bound to see a handsome appreciation. Pilandsbergs have made their appearance on the market, and diamonds are said to have been found on the property.

	Friday, 20th.	Sat., 21st.	Mon., 23rd.	Tues., 24th.	Wed., 25th.	Thurs., 26th.
African Farms ..	16 0	15 3	15 9	15 9B	16 0B	15 9
Apex Mines ..	23 0B	22 6B	22 9B	23 0B	23 6B	—
Bantjes Consol. ..	20 0B	20 6B	20 9B	20 6B	20 6B	20 6B
Benoni Consolidated	3 3B	2 10B	3 3	3 3B	3 3B	3 4B
Blaauwbosch Diam.	—	—	—	—	120 0s	120 0s
Brakpan Mines ..	70 0B	68 0B	68 0B	69 0B	69 0B	69 0B
Bushveld Tins ..	0 6B	—	0 9B	0 7B	0 7B	0 7B
Cinderella Consol.	9 0	8 9B	8 9B	8 9B	9 3B	—
City & Subs. (£4) ..	50 3	49 0	49 0	48 6B	49 3B	49 0B
City Deeps.. ..	58 0	57 3B	57 3B	57 6B	59 0	59 0
Cloverfield Mines ..	5 0B	—	5 1B	5 2B	5 2B	5 1B
Clydesdale Colls. ..	—	—	8 6B	8 6B	8 6B	—
Cons. Investment ..	—	20 0B	—	—	—	—
Cons. Langlaagtes	26 3B	25 9B	26 0B	26 6	26 6B	26 6B
Cons. Main Reef ..	18 0B	18 6*	17 9B	18 0	17 6B	17 6B
Cons. Mine Select.	—	—	14 0s	—	14 0s	—
Coronation Colls. ..	—	—	—	—	—	15 0B
Coronation Freeholds	0 4B	0 4B	05s	0 4B	0 4B	0 4B
Coronation Synd. ..	—	—	—	3 6B	—	3 0B
Crown Diamonds ..	12 3	11 6	11 9	12 0	13 9	13 6B
Crown Mines ..	—	—	—	—	—	140 0B
East Rand Centrals	8 6B	8 6B	8 6B	8 6B	8 9	8 9B
East Rand Coals (2/6)	1 9B	1 10B	1 10	1 9B	1 10B	1 10B
East Rand Deeps ..	2 3B	2 6s	2 3	—	2 3B	2 3B
East Rand Props.	52 6	52 6	52 6B	50 0B	52 6B	52 0B
East Rand Debs. ..	—	£90B	£90B	—	£93s	£91B
Eastern Golds (1/-)	—	—	—	—	—	1 8s
Frank Smith Diam.	12 6B	12 0	12 3	12 9	13 6	13 3
Geduld Props. ..	21 6B	22 6s	21 9B	22 0B	22 6B	22 0B
Geldenhuis Deeps	—	—	—	30 0B	—	—
Glencoe (Natal) Colls.	7 3B	7 3B	7 6B	7 6B	7 6	7 3B
Glynn's Lydenburg	17 6	18 0s	18 0s	—	18 0s	16 0B
Government Areas	22 3	21 3B	22 0	22 0	22 3B	22 0B
Hex River Expls.	0 7B	0 6B	0 6B	0 6B	0 7B	0 6B
Jupiters	8 6B	8 3B	8 3B	8 9s	8 3B	—
Kaalfontein D. (2/6)	0 4B	0 4B	0 4B	0 4B	0 5	0 4B
Klerksdorp Props.	—	2 0B	—	—	2 0B	2 3
Knight Central ..	9 6B	9 3B	9 6	9 6B	9 9B	9 6B
Laco Props. ..	3 9s	3 9s	3 5B	3 6	—	3 4B
Luipaardsvlei Est.	—	—	—	—	7 6B	6 6B
Lydenburg Gold Fms	3 3	3 6s	3 0B	3 3B	3 3B	3 3B
Main Reef Wests ..	9 9	9 6B	10 0B	10 3B	10 3B	10 6B
Middlevlei Estates	1 3s	1 0B	—	—	1 0B	—
Modder B's.. ..	77 0	75 0B	75 0B	77 0*	76 6B	77 0B
Modder Deeps ..	32 0	31 6	31 6B	32 0B	32 3B	32 0B
Natal Navigation Col.	—	—	15 6B	—	15 6B	15 6B
New Boksburgs ..	1 0B	0 9B	0 9B	—	0 6B	1 3B
New Eland Diam...	—	—	—	—	25 0	—
New Era Cons. (5/-)	7 0	6 6B	6 6	6 6B	6 9B	6 9B
New Geduld Deeps	2 6B	2 6	2 4B	2 5B	2 5B	—
New Kleinfonteins	21 6B	22 0s	21 3B	21 3B	21 6B	21 3B
New Modders ..	—	250 0s	240 0B	242 6B	245 0B	250 0B
New Primrose ..	—	—	—	30 0B	—	—
New Rietfonteins ..	4 9B	4 6B	4 9B	4 9B	4 6B	—
New Unifieds ..	15 0B	16 0s	15 0B	15 0B	15 0B	15 9s
Nigels	18 0B	—	—	—	19 0B	—
O.F.S. & Trans. Dia.	1 10s	2 0s	1 9B	1 9B	1 10	—
Premiers Def. (2/6)	—	—	240 0B	—	245 0B	—
Pretoria Cement Co.	54 6B	54 0B	55 0B	55 0	54 0B	54 0
Princess	6 0B	6 0B	6 0B	6 0B	6 3B	6 3B
Rand Colls. ..	3 9B	4 0	5 0s	2 6B	5 0s	—
Rand Klips ..	1 7B	1 0B	1 4B	1 4B	1 6B	1 6B
Rand Nucleus ..	—	2 6s	2 3	2 0B	2 3B	—
Randfontein Deeps	3 6B	—	3 3B	3 4B	3 6B	3 9
Randfontein Estates	26 0B	25 0B	26 0B	27 3	27 6B	27 6B
Roberts Victors ..	35 0B	36 6s	—	32 6B	32 6B	32 6B
Rooiberg Minerals	37 0B	36 6	36 3B	37 0	37 6B	36 6
Shebas	4 10B	—	—	5 0B	5 6	5 3B
Solomon's Temple Tin ..		—	—	0 6B	0 8B	—
S.A. Breweries ..	40 0B	38 0B	38 0B	38 0B	38 0B	38 0B
S.A. Lands ..	3 9s	3 4B	3 6B	3 6B	3 8B	3 6B
Springs Mines ..	17 3	16 3	16 6	16 9	16 9B	17 0
Sub-Nigels	12 6B	12 6	12 3	12 3B	12 6B	12 3B
Swaziland Tins ..	—	48 0B	52 6s	52 6s	48 0B	—
Trans. Coal Trusts	43 0	41 3B	42 3B	42 6	42 6B	42 6B
Trans. Cons. Lands	—	—	—	—	22 6B	—
Trans. G.M. Estates	52 6	51 0B	52 0B	52 6B	52 6B	53 0B
Van Ryn Deeps ..	31 3	30 0	30 9	31 6	32 3	31 9
Village Deeps ..	41 6	41 0	40 0	41 0B	42 0B	42 6B
West Rand Estates	—	—	3 6B	—	3 6B	—
Witbank Collieries	—	—	44 0B	—	45 0B	—
Witwatersrands ..	70 0B	69 0B	70 0B	72 0B	72 6B	74 0B
Wit Deeps ..	60 0	56 6B	57 6	58 9	60 6	59 0B
Wolhuters	15 0	14 0B	14 0	14 0B	13 9B	14 3B
Zaaiplaats Tins ..	43 0	41 0	42 0	43 0	43 0	42 3

B Buyers. s Sellers. * 50 Shares.

Transvaal G.M. Estates

The Transvaal Gold Mining Estates report for the three months ending March last states:—

Central Mines.—Revenue, £104,843, or 55s. 3d. per ton, from 37,950 tons crushed; cost, £39,906, or 21s. 0.3d. per ton; profit, £64,937, or 34s. 2.6d. per ton; capital expenditure, £1,668 4s.; development, 10,273 feet; total yield, 25,022.286 ozs. The most important feature of the quarter's work was the cessation of mining operations in the Clewer mine—hitherto one of the largest contributors to the mill—which has now ceased to exist as a mine. The three electric hoists which were operating in the Clewer have now been re-erected at Duke's Hill South, and this section has completely taken the place of the Clewer mine. This change has been made gradually as stopes in the Clewer became exhausted. The expectation of an improvement in the average grade proportionate to the increased tonnage from Duke's Hill has been realised. Graskop mine has shown a marked improvement, while the Theta and Peach Tree mines do not call for any special comment. The footage developed at the Central Mines amounted to 10,275 feet, or 509 feet more than the previous quarter. *Elandsdrift Mine.*—Revenue, £9,289, or 93s. 4.3d. per ton, from 1,990 tons crushed; cost, £3,617, or 36s. 4.2d. per ton; profit, £5,672, or 57s. per ton; capital expenditure, £930 9s. 6d.; development, 1,674 feet; total yield, 2,214.402 ozs. Since the electric power plant has been operating at this mine satisfactory progress has been made in the development of the dip section. Some encouraging values have been disclosed, pointing to the possibility of a fairly large area being added to the ore reserves. *Vaalhoek Mine.*—Revenue, £7,047, or 32s. 11d. per ton, from 4,281 tons crushed; cost, £4,301, or 20s. 1.1d. per ton; profit, £2,746, or 12s. 9.9d. per ton; development, 761 feet; total yield, 1,667.316 ozs. As anticipated, the profits realised from the mine during the previous quarter have been maintained without difficulty. A small pumping plant has been installed in the river section, which has opened up unusually well of late, and, now that it is possible to dewater the mine, the development of this section will be pushed forward.

Tell advertisers you saw it in the *South African Mining Journal.*

Finance, Commerce, and Industries.

Stamp Duties (Brokers' Notes). In amending the Stamp Duties Act of 1911, Parliament has paid consideration to the Chamber of Commerce's representations by providing that brokers' notes for amounts under £5 shall be free of duty, not under £25 as incorrectly stated in our last issue.

* * * *

Chance for Manufacturers. The report of the Trades Commissioner (London) for the year 1912, in addition to dealing with investigations of the trade in staple articles of production in this country (such as wool, mohair, ostrich feathers, fruit, etc.), contains valuable information on the possibilities of other articles which can be suitably grown or produced in South Africa, and for which there is a permanent and ready market in Europe and other parts of the world. The report also deals with other general matters such as advertising and exhibitions, lantern slides, problems affecting export trades, publicity work, and other sundry exports. The whole report is replete with information, and is well worth the careful perusal of agriculturists and members of the mercantile community.

* * * *

Building Activity. The estimated values of buildings, the plans of which have been approved by the undermentioned Municipal Councils for the month of May, 1913, were as follows:—Johannesburg, £94,772; Boksburg, £2,000; Benoni, £9,947; Germiston, £12,840; Krugersdorp, £1,860; Pretoria, £8,016; Roodepoort, £1,550; Capetown, £1,885; Woodstock, £975; Mowbray, £40; Simonstown, £600; Kimberley, £4,207; Claremont, £190; Queenstown, £1,450; East London, £7,877; Durban, £24,632; total, £172,841. Tenders accepted by Government for public buildings during the month, and not included in the above amount, £65,596 4s. 1d.

* * * *

Garnisheeing of Wages. The House of Assembly recently referred to the Government for consideration the report of the Select Committee, which recommended, *inter alia*, (a) that there should be uniform legislation throughout the Union in regard to garnishee orders; (b) that in order to reduce the costs Magistrates' Courts should be authorised to grant such orders, and separate scales of costs should be laid down for contested or non-contested cases; (c) the Court should satisfy itself that a sufficient amount of salary or wages is left to the debtor to enable him to maintain himself and his dependents; (d) orders should not extend to future or accruing earnings except by consent.

* * * *

Arbitrations. After consultation with the Produce Trade Section, the committee of the Rand Chamber of Commerce has adopted regulations and rules of arbitration to be recognised by the produce trade. These will be circulated also to the principal Chambers of Commerce throughout the Union of South Africa. The following definitions of recognised trade customs are included, viz.:—(1) Breach of Contract: When a buyer or seller fails to comply with the terms of the broker's note or terms of sale, he shall be responsible for the payment of any loss or *bona-fide* expenses which may be caused by the non-fulfilment. (2) Quantities: It is recommended that quantities be stipulated for in tons (of 2,000 lbs.), and charged for at per 100 lbs. net. A contract for delivery of a certain weight is to be considered as completed by the delivery of 2 per cent. above or below the stipulated quantity. (3) Quality: Any dispute in regard to maize shall, unless the sale be from sample, be settled by comparison with the Government standard export samples of the season. Where no grade is specified, "f.a.q." standards shall apply. (4) Delivery: In the absence of special stipulations, it shall be considered that railing must be "prompt"—which shall mean railing within seven days. "Immediate" delivery shall mean despatch within four days after receiving forwarding instructions. (5) Forward Purchases—Monthly Deliveries: When the delivery is to be made at buyer's option during a specified month, the railing shall be commenced within four days of receipt of instructions and shall proceed with reasonable despatch. (6) Transfers: In cases of transfers at mills, the seller shall be held responsible for delivery until the buyer has given him a receipt or an acceptance of the transfer as delivery. The buyer must, however, do this within 24 hours after notification has been made. (7) Rejections: When a minimum of 10 per cent. is found below quality in any one truck, the buyer may reject the truck within 24 hours after delivery has been tendered by the railway. Rejections to be replaced within seven days.

* * * *

B.S.A. Trade. The following statement is supplied by the British Trade Commissioner's Office, Capetown, covering the external trade of the United Kingdom (with special reference to British South Africa) for the three months ended March 31st, 1913. The "accounts relating to the trade and navigation of the United Kingdom," for the quarter ended March 31st, show that the values of the merchandise imported into, and exported from, the United Kingdom during the quarter were as follows:—Imports, £196,000,000; exports (United Kingdom produce and manufactures) £127,000,000; re-exports (foreign and Colonial merchandise), £31,000,000. Compared with the figures for the first quarter of 1912 (the highest March quarter previously recorded) these values show that imports increased by £8,500,000, or 4·5 per cent., and ex-

The Glencoe (Natal) Collieries, Ltd.

Dividend No. 11.

NOTICE IS HEREBY GIVEN that the above Company has this day declared an Interim Dividend of Sixpence (6d.) per share, being at the rate of Two and a half per cent. (2½%), for the half-year ending 30th June, 1913, payable to Shareholders registered in the Books of the Company on the 9th July, 1913.

Dividend Warrants will be issued as soon as possible after receipt of London Transfers.

The Transfer Books of the Company will be closed from the 10th to the 17th July, 1913, both dates inclusive.

By Order,

NORMAN SMITH,
Secretary.

Head Offices:
159/160, Stock Exchange,
Johannesburg.
25th June, 1913.

68486

Durban - Roodepoort Gold Mining

COMPANY, LIMITED.

(Registered in England.)

NOTICE IS HEREBY GIVEN that a Seventy-eighth (78) Interim Dividend of Ten per cent. (10 per cent.), equal to 2s. (Two shillings) per share, has been declared payable on and after the 28th of June, 1913.

Holders of Shares to Bearer should present Coupon No. 78 for payment of the above 2s. (Two shillings) per share at the Standard Bank of South Africa, Ltd., Johannesburg Branch, on or after the 28th June, 1913.

W. A. MARTIN,
W. MACFARLANE,
L. CLARENCE, Local Directors.

Johannesburg, 6th of June, 1913.

ports increased by £8,500,000, or 7·3 per cent, whilst re-exports suffered a slight decrease to the extent of 0·3 per cent. The figures quoted above would appear to show a satisfactory expansion in trade, especially when the facts that February, 1913, contained one day less than February, 1912, and that the Easter holidays fell in March this year as against April in last year, are taken into consideration. The increase of eight and a half millions in the value of imports includes increases of approximately five and a quarter millions in "raw materials and articles mainly unmanufactured," and of three and a quarter millions in "articles wholly or mainly manufactured." About five and a quarter millions of the increase of eight and a half millions in exports of United Kingdom produce and manufactures is accounted for by "articles wholly or mainly manufactured," but there was also a large increase in the value of coal exported, due partly to the fact that the coal strike was in operation in March, 1912. The foregoing statement relates solely to merchandise. The total values of gold and silver bullion and specie imported and exported during the quarter were as follows:—Imports, £16,000,000; exports, £11,900,000. The values of imports from, and of exports and re-exports to, British South Africa during the first quarters of the years 1912 and 1913 were (values of merchandise only, exclusive of gold and diamonds):—Imports, 1912, £3,157,000; 1913, £4,023,000. Exports (United Kingdom produce and manufactures), 1912, £5,876,000; 1913, £5,838,000. Re-exports (foreign and Colonial merchandise), 1912, £501,000; 1913, £181,000. There was thus a considerable increase in 1913 in the imports from South Africa, whilst the exports to South Africa were but little less than for the same period of last year. Among the principal articles were:—Imports from British South Africa: Wool (sheep's or lambs'), £2,319,000; mohair (Angora goats' hair), £142,000; skins (goats' or sheep's), £359,000. Exports to British South Africa (of United Kingdom produce and manufactures): Iron and steel and manufactures thereof (so far as distinguished in the monthly accounts), £657,000; machinery (so far as separately distinguished), £353,000; cotton piece goods, £327,000; apparel, £916,000; boots and shoes (of leather), £308,000. The value of the gold bullion imported from British South Africa during the quarter under review was £9,580,000, as against £9,711,000 for the same period of the year 1912.

* * * *

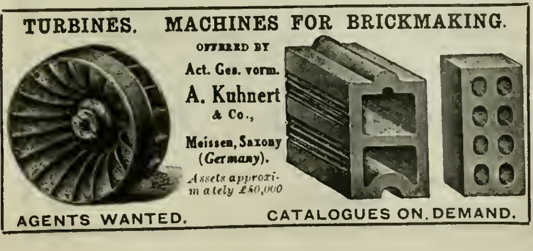
Whaling Enterprise.

The Consolidated Whaling Company, of which Sir George Doughty is chairman, is erecting a whaling station at the Bluff, Durban, at which whales are to be treated by a new process, the oil being extracted chemically by means of benzine, in place of boiling. There is, we understand, only one other plant of this description. This is in British Columbia. It is believed this process will lead to a far larger extraction of oil than by the old process.

* * * *

Netherlands Bank.

Little difference is shown by a comparison of the report of the Netherlands Bank of South Africa for 1912 with the results achieved during 1911. The directors point out that, to a greater extent than in former years, the smaller branches, which are in close contact with the farming population, contributed to the business of the period under review, while Johannesburg business, on the other hand, was more restricted. Full provision having been made for bad and doubtful debts, and a substantial sum set aside for depreciation of bank premises, the net profits for 1912, including the balance of £690 brought forward from 1911, total £16,162, and the directors recommend a dividend of 4 per cent., absorbing £9,600, while they propose to transfer £3,000 to the reserve fund, making it £27,000, to allocate £2,950 to internal reserve for depreciation of fixed property, and to carry forward to new account £612.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Assets approximately £80,000

AGENTS WANTED. CATALOGUES ON DEMAND.

The best "Reef Traveller" is the *South African Mining Journal.*

May Consolidated Gold Mining Co.,

LIMITED.

(REGISTERED UNDER THE LIMITED LIABILITY LAWS OF THE TRANSVAAL.)

DECLARATION OF DIVIDEND No. 30.

NOTICE IS HEREBY GIVEN that a Dividend of 5 per cent. (One shilling per share) has this day been declared, payable to all Shareholders registered in the Books of the Company at the close of business on Monday, the 30th June, 1913, and to Holders of Coupon No. 30 attached to Share Warrants to Bearer.

The Transfer Books of the Company will be closed from the 1st July, 1913, to the 7th July, 1913, both days inclusive, and Dividend Warrants will be issued to European Shareholders from the London Office, and to South African Shareholders from the Head Office, Johannesburg, as soon as possible after receipt of the Transfer Returns from the respective Offices.

Holders of Share Warrants to Bearer are hereby informed that they will receive payment on and after Friday, the 1st August, 1913, of the Dividend of 1s. per share after surrender of Coupon No. 30 at either of the undermentioned Offices:—

Head Office: Silesia Buildings, Main Street, Johannesburg.
London Office: Pinner's Hall, Austin Friars, E.C.;
Berlin Agency: 17/20 Kanonier Strasse, W. 8;
Paris Agency: 25 Rue de Clichy.

Coupons must be left four clear days for examination, and may be presented after the 27th July, 1913. Any Coupon or Coupons, however, presented for payment at the Berlin Agency or the Johannesburg Office must be accompanied by an Affidavit declaring the full name and residence of the owner of the Share Warrant or Warrants from which such Coupon or Coupons have been detached, and the Company, before paying the amount of such Coupon or Coupons, shall be entitled to deduct therefrom the amount recoverable in respect of any Government Taxes or Imposts which would have been recovered had such Coupon or Coupons been presented at the Company's Office situated in the State or Country in which the said owner resides.

Forms of Affidavit and Listing Forms can be obtained on application at the Company's Head Office, Johannesburg, and at the Berlin Agency.

By Order of the Board of Directors,
C. L. CHALMERS.
Secretary.

Head Office:
Silesia Buildings, Main Street
(P.O. Box 166), Johannesburg,
27th June, 1913.

Johannesburg Consolidated Investment Co., Ltd.

NOTICE IS HEREBY GIVEN that a Dividend of 5 per cent. has been declared, payable to all Shareholders registered in the Books of the Company at the close of business on Monday, the 30th June, 1913, as soon as the necessary returns are received from the London Office.

The Transfer Books of the Company will be closed from the 1st to the 12th day of July, 1913, inclusive.

By Order of the Board,
W. H. MARDALL.
Secretary.

Automobile Notes.

Graphite Lubricants for Motor Cars and Motor Cycles.

A month or two ago, in our mining notes, we commented upon the excellent results shown in tests made of the highly efficient graphite lubricants recently introduced on the South African market, by Messrs. Selcraigs (Colonial), Limited, of Johannesburg and Glasgow, the sole agents in South Africa for the company manufacturing these lubricants in Glasgow. These lubricants are manufactured in various forms to suit every class of mechanism, including motor cars and motor cycles, etc., and those specially prepared for the latter are now being used extensively by motorists and aviation experts in the Old Country. Many highly satisfactory reports have been received from the users, some of which we have seen. We have much pleasure in giving extracts which we publish and commend to the careful consideration of the numerous motor car and motor cycle experts amongst our readers. Mr. C. W. Grey, editor of the "Aeroplane," without advertisement and entirely off his own bat, writes: "I have been using the graphite motor oil in the engine of my 12-14 Calthorpe for some weeks. I can say that the car is running now better than she ever did before, and when starting up from cold there is no sign of stickiness about the engine." Also Mr. G. Lee Temple, an aviator and motor cyclist of Hendon Aerodrome, has tested our oil on his motor cycle and Anzania air engine, with excellent results, and reports as follows: "Having given the oil, a sample of which you sent me, a thorough scientific testing, both in the aeroplane and on the racing track, I have pleasure in testifying to its excellence for high speed internal combustion engines. The following particulars may be of interest: On Brooklands track I attained a speed of 56 miles per hour with a 2½ light weight motor cycle. At this speed my engine was revolving at a speed close on 4,000 r.p.m. I have also used your oil on Anzania aeroplane engines, and can trace no signs of over-heating, and as far as it is possible to tell, the oil was as suitable as any other specially prepared for aeronautical work." The Austrian Daimler Co. have been testing the oil, and report as follows: "The trial on the test car has been so far quite satisfactory. As a matter of fact, the two gallons we sent them have lasted for 600 miles. In order to let graphite thoroughly coat the bearings they have decided to let the car do another trip. At the same time another car was otherwise tested and the result was that this car has already come back for repairs, as the oil had carbonized." The St. Andrews Ambulance Association tested our motor oil and gear box grease, and were so satisfied with the smooth running that they will now adopt the graphite lubricants for future use. The company adds: "We have a number of private friends who have tested this oil, and the opinion of them all is—It is the best oil for lubrication on the market." Mr. G. Lawrie Campbell, an influential gentleman of Braevallich, Lochaweside, writes: "I have lent my new car to Mr. Calderhead (who is an expert motor engineer) to have her tuned up, as all new cars require to be tuned up at first, and he is also testing the graphite motor oil, and so far the oil has given great results. Mr. Calderhead says that this is the oil that the motor trade has been looking for for years, as it keeps them cool and does not carbonize. Mr. Calderhead is confident that this oil is second to none on the market at present."

* * * *

Among the suggestions put forward towards the solution of the fuel problem, the latest is that of Mr. Doherty, an American gentleman interested in gas companies in that country, who, at a recent gathering of automobile and gas engineers, presided over by Lord Montagu of Beaulieu, discoursed upon that important question, and urged the desir-

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1st Targa Florio (640 Miles) on CONTINENTALS
1st Gaillon Hill Climb (101½ m.p.h.) on CONTINENTAL

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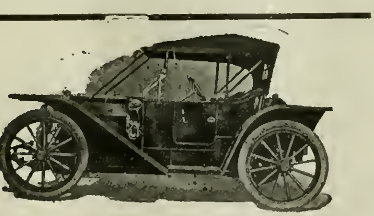
LONDON. HANOVER.

ability of stripping town gas of its benzol in order to augment the supply of that spirit for motor car use. Benzol is an important constituent of the illuminating power of town gas which has, under Act of Parliament, to be maintained at a certain standard. It is apparent, therefore, that any serious proposal to withdraw it would involve legislative action, and is certain to arouse considerable opposition on the part of the consumers, notwithstanding the facts that the absence of benzol is of no consequence where incandescent burners are used, and that not more than five per cent. of the gas produced anywhere is consumed in flat, open flame burners. It is stated that if all the gas consumed in London were stripped of its benzol, a quantity sufficient to supply three-fourths of the fuel required by the London General Omnibus Company would result. It is doubtful, however, if this could be done without necessitating an increase in the lighting supply, as, by the withdrawal of the benzol from the gas, it is computed that about seven per cent. of the calorific value of the latter is lost, and this would have to be made good in order to maintain the illuminating standard required by the law. Mr. Doherty has been invited to submit his scheme in detail to the Petrol Substitutes Committee for examination.

* * * *

The General Committee of the Royal Automobile Club has submitted its annual report of the work done by the R.A.C. and Associated Clubs during the year 1912. The period under review has been one of great activity, and the Committee is to be heartily congratulated on the successful accomplishment of much useful work in the interests of automobilists, the arrangement of some valuable additions to the advantages of membership of the Association, and a considerable increase in the membership strength of the whole organisation. Among the many important matters that have occupied the attention of the Committee may be mentioned the negotiations with local authorities which resulted in the removal of central tramway standards on the Great North Road in the urban district of Finchley, the education of children in the matter of modern traffic dangers through representations to School Boards, the amelioration of the conditions responsible for road obstruction by heavy locomotives, the posting of caution signs at the entrances of a large number of towns and villages, the establishment of a system of R.A.C. Touring Guides on the roads, the institution of the "Get you home" badge, an improved insurance policy, etc. The Legal Department has defended 866 summonses against members and associates, legal advice has been given by the Club's solicitor personally to upwards of two thousand members and associates, between five and six thousand have been advised by letter, between 30 and 40 local inquiries into applications for speed limits have been attended, numerous private Bills have been examined and the interests of motorists guarded where clauses inimical to them were found, and a number of arbitrations have been conducted.



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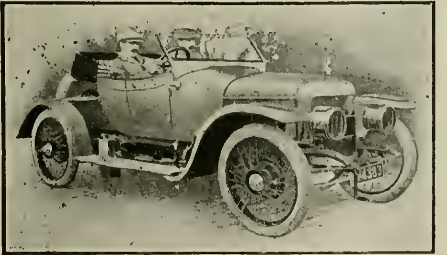

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Tenders Open.

The Carolina Village Council invite tenders for the following:—No. 1 Contract: Supply of pipes and connections, delivered Carolina Station; principal quantities: 8,900 feet 3-inch galvanised iron piping, 22,000 feet 1½in. galvanised iron piping, "or alternate tender, same quantities, black piping." No. 2 Contract: Supply of pumping plant, oil, steam, or suction gas; 2 pumps with capacity of 2.000 gallons per hour each, capable of being run by native. No. 3 Contract: Construction of Works—Building, reservoir, sump reservoir, engine house, excavating and laying pipes for reticulation system, laying pipes and making house connections, fitting up, plumbing, etc. *Engineering.*—No. 4 Contract: Supervising construction of works on the Council's behalf. Tenderer to produce proof of his ability to undertake the work from a technical point of view as well. General conditions: Draft contracts, specifications, and quantity schedules may be inspected at the Town Office, Carolina, during ordinary business hours, and obtainable upon paying a deposit of £2 (cash, bank draft or initialled cheque) with each application. Tenders, in sealed envelopes, marked "Tenders Carolina Water Supply Scheme," must be lodged at the office of the Carolina Municipality not later than 12 noon on Monday, 21st July, 1913.

The Newcastle Corporation invite tenders for the supply of 5in. and 6in. Steel Pipes, with all fittings and accessories, for the Waterworks Department, together with two Mechanical Filters. (July 5.)

Tenders Accepted.

The following tenders were accepted by the Union Government for public buildings during the month of March, amounting to £65,596 4s. 1d.:—

Erection of cattle dipping tanks, N'qutu and Ndwandwe Divisions, Natal. Messrs. Stanley Jackson Bros., Pietermaritzburg.

Additions to Eastern Districts Court Buildings, Grahamstown. Messrs. Harris and Harrower, Uitenhage Street, Port Elizabeth.

Removing and re-erecting a wood and iron building, Jeppes, Johannesburg. Mr. R. J. Till, Box 4861, Johannesburg.

Repairs and painting Volunteer Offices and Buildings, Durban. Mr. E. Thompson, Gumtree, Berea Road, Durban.

Additions to Addington Hospital, Durban. Mr. W. Cornelius, Manning Road, Durban.

Alterations, additions, and drainage work, Asylum, Pietermaritzburg. Messrs. Jesse Smith and Sons, Commercial Road, Pietermaritzburg.

Erection of five sheep dipping tanks alongside existing cattle tanks—two in Alexandra, one in Mapumulo, one in Durban, and one in N'Kandhla Divisions. Mr. J. Rodel, Hopson's Avenue, Berea, Durban.

Erection of sheep dipping tanks alongside existing cattle tanks, Division of Lower Umzimkulu, Natal. Mr. G. K. Schmalz, Port Shepstone, Natal.

Erection of bridge over Ingagane River, farms Ballengeigh and Leicester, at Newcastle. Mr. C. Polto, Box 594, Pretoria.

Alterations, repairs, and painting the buildings at Addington Hospital, Durban. Mr. S. P. Smith, 12, Albert Street, Durban.

Alterations and additions to Post Office, Grahamstown. Messrs. Harris and Harrower, Uitenhage Street, Port Elizabeth.

Erection of school for sixty-four pupils and teachers' quarters, Koppieskraal. Mr. J. Lee, P.O. Box 342, Krugersdorp.

Erection of school for forty-eight pupils and teachers' quarters, Naboomspruit. Messrs. Waardhuizen and Korner, Maré Street, Pietersburg.

Alterations to, supply, etc., of science fittings for Bacteriological Laboratory, Onderstepoort, Pretoria. Messrs. Prentice and Mackie, 127, Schoeman Street, Pretoria.

Erection of police buildings (Tin Mines Police Post), Groenfontein No. 871, Waterberg. Messrs. Nielson and Co., Box 14, Potgietersrust.

Erection of new native and Indian wards and additions to servants' quarters, Newcastle Cottage Hospital, Natal. Mr. W. A. Ross, Newcastle, Natal.

Erection of new Infants' School for 250 pupils, Boksburg. Mr. A. McLeod, Box 82, Boksburg.

Erection of eight sheep dipping tanks, Pietermaritzburg, Richmond, Impendhle, and Estcourt Divisions respectively. Mr. H. G. Gordon, Pietermaritzburg.

Erection of new offices and stores at Bacteriological Laboratory, Onderstepoort, Pretoria. Messrs. Prentice and Mackie, 127, Schoeman Street, Pretoria.

Erection of Cottage Hospital, Umtata, Cape Province. Messrs. Murdoch and Co., Box 187, Pretoria.

Erection of Post Office, Carolina. Mr. P. Robertson, Box 113, Middelburg.

Erection of Police Station, Marquard, Orange Free State. Mr. W. F. du Plessis, Box 3, Marquard, Orange Free State.

Erection of Assistant Director's house at Bacteriological Laboratory, Onderstepoort, Pretoria. Messrs. Prentice and Mackie, 127, Schoeman Street, Pretoria.

Erection of Police Buildings, Kenilworth, Johannesburg. Messrs. Templar Bros., Box 161, Johannesburg.

Erection of bridge over Rabula River, Kingwilliamstown. Mr. C. L. Schuddink, 117, St. George's Street, Capetown.

Erection of clerks' quarters, Rietfontein Lazarello. Mr. E. H. Elbourn, 301, Fox Street, Johannesburg.

Erection of police buildings. Heilbron, Orange Free State. Messrs. Ford Bros., Box 62, Heilbron, Orange Free State.

New Patents.

196. Thomas Faichney Davidson.—Improved method and apparatus for grading oranges.
197. David Jacobs and James Frederick Gitting.—The patent pump force petrol tanks promoters, etc.
198. Harris Freedman.—An improvement projecting pantagraph or repressing on a horizontal plane, plans, drawings or the like drawn on an inclined plane.
199. Lewis Condict Bayles.—Improvements in percussive tools.
200. Wm. George.—Improvements in rock drill bits.
201. Cornelius Fredrick Delfos.—An improvement in chucks for rock drills and the like.
202. Sidney Sherrard Osborn.—Improvements in centrifugal amalgamation.
203. (1) Evan Thomas Munro (2) John Alexander Munro.—An improved tool for branding horses, cattle, sheep and other animals.
204. Albert Carmel.—Carmel's specific for influenza colds and the like.
205. John Hudson Hughes.—An improved automatic coupling for use on railway vehicles and the like.
206. John McEntyre.—Centre buffer appliances for railway trucks.
207. (1) Frank Ondra, (2) Max Pollak.—Percussive tool with detachable cutter.
208. Matthew Arnold.—Improvements in ore pulverising machines.
209. Cyril Douglas McCourt.—Improvements in and relating to heating by combustion of combustible mixture.
210. Edward Dossor.—Improvements in charging and tamping blasting charges.
211. Alfred Jarres.—Improvement in apparatus for agitating or collecting ore pulp.
212. Wm. Arthur Wafford.—Improved process for the manufacture of paint.
213. (1) Wm. Richardson (2) William Staveley.—Improved safety apparatus for mining cages.
214. (1) Benjamin Wm. Bates (2) Henry Weldon Kelly (3) Douglas Haynes Corbin.—Improvements in target apparatus for use with kinematograph.
215. Cornelis Fredrik Delfos.—An improvement in chuck keys and chuck pads for rock drills and the like.
216. James Hamilton Stirling.—Improvements in and relating to steam superheaters for locomotive and like tubular boilers.
217. Walter Sketon Hudson.—Improvements in or relating to tip wagons.
218. Wilhelm Roths.—Improvement in and in connection with waste or like carding and breaking machines.
219. John Sellers Rawcroft and Mauritz Christian Indahl.—Improvements in or relating to feed mechanism for composing or type casting and composing machines.
220. Gotthilf Anagarius Betulandr.—Improvements in impulse transmitters for automatic telephone plants.
221. Henry Philip van Eyck.—Improvements in apparatus utilizing the force of gravity for the development of power.
222. Herbert Charles Carter.—Improvements in safety hooks.
223. Herbert Charles Carter.—Improvements in spark arresters.
224. Kenneth Bertram Lamont.—Improvements in securing collars or like parts to shafts.
225. Thomas Arthur Binks.—Improvements in the construction of poultry runs, houses, cages and the like.
226. Arthur Mutter Hocke.—Triangular bar screens.
227. Segismurd Rudolph James Maynard.—Baffle doors.
228. George Watson Lait.—Level crossing and road traffic directing apparatus.
229. Wm. John Moore Willis and John Henry Marshall.—Improvements in and in connection with radiators for internal combustion engines.
230. George Francis Joseph Gaydon.—A new or improved combined account form and envelope or cover; also applicable for circulars, advice notes, statements, advertisements, and the like.
231. John Godfrey Parry Thomas.—Improvements in and relating to electro-mechanical transmission of power.
232. (1) Heinrich Flottmann, (2) Heinrich Flottmann and Co.—Improvements in or relating to conveyors.
233. Settimo Viesi.—System or arrangements for elevating and transporting liquid explosives from one operating place to another.
234. Thomas Passe.—Improvements in rotary engines and the like.
235. John Thomas Hird.—Improvements in quick detachable railway sleepers.
236. William George.—Improved detachable bit heads.
237. Gotthilf Ansgarnis, Betulander.—Improvements in or relating to selectors especially for use with automatic telephone exchanges.
238. Gerald St. John Day.—Improved terminal mounting and cord gripping means for electric lamp holders, adaptors, or the like.
239. (1) George Warren, (2) C. E. Cadle, (3) G. D. Innes.—Improved detachable bit for drilling rock.
240. John Conrad Lind.—Improvements in tamping plugs for blasting purposes.
241. Robert Henry Hollingworth.—The Hollingworth improved geyser.
242. Lancelot Usher.—Improvements in pipe and tube fittings and couplings.
243. Otto Banner.—Improvement in centrifugal compressors.
244. (1) Walter Bury Incledon, (2) Robert Arnold Blakeborough, (3) John Beardsell Broadhead.—Improvements in sluice or gate valves.
245. James Conning.—Improvements in water spraying apparatus for use in mines.

THE SOUTH AFRICAN
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WITH WHICH IS INCORPORATED
South African Mines, Commerce and Industries.
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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Knights Deep's New Plant.

Metallurgical reorganisation at the Knights Deep mine has now been completed. The new tube mills were got into operation some little time ago, and the new classification plant and cyanide tanks were started early last week. In May the company had 400 stamps and 11 tube mills at work and crushed 110,700 tons for a profit of £22,031.

* * * *

" Sopa " Diamonds.

We have had numerous enquiries as to the whereabouts of the Sopa Diamond Mine. The inclusion of the name of this concern in the African section of the sharemarket reports of certain London financial papers has given rise to a general impression that " Sopas " are South African stocks. This, as a fact, is not so. The Sopa diamond property is situated in Brazil, and it is understood that the " leading light " in the flotation is Mr. Edmund Davis.

* * * *

National Diamonds.

The mine will start crushing on or about the 15th with a full plant of crushers, rollers and four large pans, some of 12 feet and some of 14 feet. The mine is opening up even beyond expectations, and it is anticipated there will be no difficulty in treating the so-called hard " blue." Meanwhile the small pans have been working with very satisfactory result, which helped to meet the expenditure and cost of erection. It may be mentioned that the National Diamond Prospecting and Developing Syndicate bought the old Kaalfontein property, which forms part of the No. 2 pipe, and includes also what was known as the No. 3 pipe.

* * * *

Village Main Reef Annual Meeting.

Mr. M. A. Braunstein, presiding at the annual meeting of the Village Main Reef Gold Mining Co., Ltd., in London last week, said that since its formation the company had paid nearly three millions sterling in dividends, and during the last five years the dividend had not fallen below 70 per cent. per annum. Unfortunately, said the speaker, the mines did not live for ever. They would in a few years have exhausted all the ore that could profitably be worked. Their ore reserve amounted to 1,683,066 tons, assaying 33s. 7d. to the ton. There were also undeveloped areas which would probably yield 600,000 tons of ore. The chairman dealt with the labour position, and announced that it had been decided to join the recruiting corporation. He emphasised that the company had done everything possible to eradicate miners' phthisis, by the prevention of dust, and giving the utmost attention to hygiene. He anticipated that the life of the mine was about five years.

* * * *

Rand Mines, Limited.

The mines controlled by the Rand Mines, Limited, have adopted the innovation of publishing all the quarterly reports in pamphlet form. This is a step in the right direction, for not only is it more economical but one has the information of the whole group in a nutshell. The General Mining and Finance Corporation have issued the quarterly reports of their subsidiaries in the same form for some time past, and no doubt the example will be followed by all the big Houses. A holder of any one share would be sufficiently curious to see how other companies in a certain group were progressing, so the pamphlets would be useful in spreading knowledge which otherwise would only be obtainable through the medium of newspapers.

Tin Production and Profits.

Consequent upon the rise in the value of tin, the affairs of tin mining undertakings have been receiving an increasing amount of attention in London during the last few years. The established producers of the white metal have been earning larger profits, and this fact has led to the provision of working capital for the development of numerous new enterprises in the hope that they, too, will be productive in time to benefit by the very satisfactory price commanded by metallic tin. So far, however, there has not been any great expansion in production. Northern Nigeria, the newest field, is turning out a fair amount, considering the youth of its mining industry, but consumption has also been increasing, so that the new supplies from this and other sources have been easily absorbed. As regards the older producers there has been no marked increase, despite the inducement afforded by high prices. On the contrary, the tendency with some of the old stagers has been retrogressive. Lately there have been issued the annual reports of four of the principal tin producing companies whose shares are held by speculative investors in the United Kingdom, and on comparing the statistics therein contained with those in preceding documents we find that three out of the four companies have produced less tin as the price of the metal has risen. Between them these four enterprises—three Malayan and one Tasmanian—are responsible for an annual production of over 4,000 tons of black tin, a quantity which is approximately equal to two-thirds of the whole of the tin sold at the Cornish tin ticketings during the past year.

* * * *

German Diamond Sales.

It was not to be expected that such an active and ambitious gentleman as Mr. Adolf Wagner would consent to go into retirement, and we are not surprised to learn of his future plans as outlined in the following paragraph. The Berlin correspondent of the *Financial News* writes under date June 3:—Three concerns, according to the *Berliner Tageblatt*, now tender for the purchase of the 1,000,000 carats of German South-West African diamonds offered for sale. These are the firm of Coetermann, Kryn, and Walker, of Antwerp, which has hitherto purchased the quantity on offer, the De Beers group, and the new German firm formed recently under the auspices of the Berlin banking concern of Koppel & Co., under the style "Deutscher Diamanten-Verband" (German Diamond Association), with a preliminary capital of 100,000m., which, however, will be automatically increased to 6,000,000m. in the event of the Deutscher Diamanten-Verband being allotted the quantity on offer. Mr. Adolf Wagner, formerly intimately connected with the Premier Company, is stated to be the most prominent member on the board of administration of the new company, being described as the "driving power"; while Privy Commercial Councillor Leopold Koppel, of Messrs. Koppel & Co., is also on the board, to which, however, Herr Dernburg, the former Colonial Secretary, despite statements published to the contrary, does not belong, though the interest taken by him in the new movement is unquestionable. A later message from Berlin through Reuter states:—"The price offered by the Antwerp Diamond Syndicate, the successful competitor in the tenders for the sale of 1,000,000 carats of German South-West African diamonds, was the unexpectedly high one of 46 marks per carat. The average price obtained during the previous year was only 29·36 marks per carat. The remarkable increase in the price is attributed partly to the improvement in the quality of the output, brought about by the Pomona stones, but largely also to the competition for the contract which was instituted in response to a demand from the mines in the colony."

Royal School of Mines' Dinner.

The proceedings at the annual dinner of the Royal School of Mines in London this year were very successful and interesting, though bereft of the presence of one who had never failed to be present on these occasions, of which there have been no fewer than 40. Mr. Arthur C. Claudet is no more, and his place cannot easily be filled. The speech of Mr. Trewartha-James was useful as showing the necessity of specialised training and the value of the work of young associates of the Royal School of Mines. Most people will agree with him in describing the presidential address delivered by Mr. Bedford McNeill at the Institution of Mining and Metallurgy, as "one of the most noteworthy that has ever been delivered before the members of that body." The speech of the chairman, Mr. Frank Merricks, was most appropriate to the occasion, and we note his point that during last year the value of the metals and minerals, including coal and precious stones, produced in the British Empire, amounted to about £250,000,000 sterling a year. Such an industry as this, he argued, deserved to be fostered, but he thinks the Royal School of Mines has been somewhat neglected. Mr. T. A. Rickard made an excellent speech, in which he appealed to those present to carry on the work of the late Mr. Claudet.

* * * *

Life of the Nigel.

Mr. Leonard Line, J.P., chairman of the Nigel Gold Mining Co., celebrated the company's 25th anniversary on May 14 last by giving a dinner to his colleagues at the Victoria Club, Pietermaritzburg, Natal. The menu card was suggestive, and that is our reason for referring here to what was apparently a purely private function. It bore on its face the following:—

The Nigel Gold Mining Company,
Limited.
1888—1913.
FINIS 193—?

This evidently indicates what is in Mr. Line's mind as regards the life of the property. His "official" opinion on the subject, as given at the annual general meeting, is that the company has large areas still unexplored, and there is no reason why these areas should not contain the same proportion of payable reef matter which the exhausted portion contained. "Assuming," he said, "that this is so, the Nigel has many years of life before it yet; but, of course, the proof of this is in the womb of the future, and any computations made to-day must of necessity be so problematical that I am not prepared to fix any arbitrary period for the life of the Nigel mine."

* * * *

Madagascar Again.

H.M. Consul at Antananarivo reports, on the authority of the mining department of Madagascar, that the graphite industry in the island is making considerable progress, the quantity exported during the first quarter of this year amounting to 980 kilogs., as compared with 474 kilogs. during the corresponding period of last year, and 259 kilogs. for the corresponding period in 1911. It is believed that, by 1916, the quantity exported will reach 20 metric tons annually. The department has, says the *Board of Trade Journal*, suggested that a market for graphite should be established in France, possibly at Havre. At present the important graphite markets are London, Antwerp and Hamburg, whence French firms obtain all their supplies of crucibles, lubricants and other graphite goods.

* * * *

Diamond Drilling.

Mr. A. E. Hall, in a paper in the "School of Mines Quarterly," points out that one of the most important items in the cost of drilling is the time required for operations other than actual drilling, which may properly be called lost time; of this, pulling and lowering the rods account for the greater part. The proportion of time lost can be reduced by good judgment on the part of the drill runner. Records show that in some cases less than 60 per cent. of the shift was used in actual drilling; the highest efficiency was 76 per cent. This is one of the reasons for the high cost of diamond drilling. Another item on which the judgment of the runner has a great influence is the speed of rotation adopted. The hardness and character of the rock are the controlling factors, which must be estimated in the light of observation and experience in order to determine the proper speed. During a period of five and a-half months, in which two drills ran for the whole time, and two drills for one and a-half months only (equivalent to one drill for fourteen months), a total of 10,728 ft. of hole was drilled, or

730 ft. per month per drill. The drills worked twenty-six days per month, on two ten-hour shifts. This gives a general average of 14 ft. per shift. A third factor on which the skill of the runner has a great influence is the cost of carbons per foot. The actual wear depends directly on the character of the rock, but the runner has to decide at any given time whether to use the bit for another run or to put down a new one. Several of the holes above mentioned cost, for carbons, less than 7½d. per foot. Another hole, in which all new stones were used, showed a cost of over 8s. 4d. per foot for carbons; this was due to the breaking of several of the stones. Being unworn, they had sharp edges and corners, which accounts for the breakage and chipping.

* * * *

The Dowsing Rod.

The dowsing rod for the discovery of ore-bodies (remarks the *Engineering and Mining Journal*) is much more ancient than the goldometers, Spanish needles, electrical mineral indicators, etc., that are sometimes exploited commercially when the United States Post Office authorities are not looking, and it still has a standing in Cornwall. The Cornish correspondent of the *Mining Journal* is evidently no doubting Thomas. Thus in a recent issue of our British contemporary he reports that " The value of the dowsing rod has once more been exemplified in the location of metalliferous-bearing lodes. Mr. John Vivian, J.P., C.C., the licensee of the West Grenville sett, having requisitioned the services of two independent exponents of the art, has been rewarded by having three separate lodes located, the indications showing that they traverse the sett for over a mile, the sett itself being some 1½ miles long by about 1½ miles wide. The dowsing-rod discoveries have since been verified by prospecting pits being sunk, with the result that one of the lodes shows the characteristics of the Great Flat lode, which proved so valuable to the Basset, South Condurrow, and Wheal Grenville mines. One of the other lodes discovered, which has been styled ' the South Lode,' is believed to have been previously unknown. Arrangements are being made for testing the lodes to a little greater depth, as there is at present scarcely sufficient uncovered to give reliable data regarding sizes and values; however, in the neighbourhood it is considered the possibilities for this property are immense." Our New York contemporary doesn't see why the dowsers should stick to Cornwall, when there are so vastly superior opportunities in America, or (we may add) in South Africa.

* * * *

Detection of Carbon Monoxide.

Two methods for the detection of small quantities of carbon monoxide in the air were described recently before the Paris Académie des Sciences. The first method, the idea of Armand Gautier, is based on the reduction of iodic acid by carbon monoxide at temperatures varying between 60 deg. and 80 deg. C. The air is collected in an aspirator, and then passed into a vessel containing iodic acid at 70 deg. C. The iodine is passed into a tube of chloroform, which assumes a pink coloration varying according to the amount of carbon monoxide present in the air, which is estimated by comparison with the colour of tubes containing a known quantity of iodine in the same volume of liquid. By this method (says the *Chemical Trade Journal*, 18th January, 1913) it is claimed that one part of carbon monoxide in 200,000 parts of air can be detected. In the second method, described by M. Guasco, it was shown that the rise of temperature indicated by a mercurial thermometer, the bulb of which is covered with platinum black, is only a few tenths of a degree for each one-tenth of 1 per cent. of carbon monoxide present. In order to obtain thermometric differences easily discernible, use is made of Leslie's differential thermometer, one of the bulbs of the U-tube being coated with platinum black. By means of an outer cover the bulbs are protected from direct contact with the atmosphere, the air penetrating through a porous partition in the outer covering. Any change in the levels of the liquid in the U-tube is noticeable, and the proportion of carbon monoxide present in the air is indicated by a graduated scale.

TOPICS OF THE WEEK.

THE STRIKE AND ITS CONSEQUENCES.

As we go to press there are signs that the labour leaders are succeeding in their design to " pull out " without a ballot all the miners on the Rand, and that a general strike has begun. The daily papers have reported, *ad nauseam*, the inadequate issues upon which the contest is being fought, and we merely purpose to offer here a few general comments. The consequences of their attitude can scarcely have occurred to the miners, and it is only fair, at this stage, to disabuse their minds of any belief in the support of enlightened public opinion. In following and speculating upon the immediate effects of a strike of this kind, involving some expense to the mines and considerable hardship to the men, there is a danger that the great issues at stake may be overlooked, and that the far-reaching, self-destructive nature of the action, as far as the miners are concerned, may be obscured. To the many factors of uncertainty which beset the mining industry on the Rand, a strike of the present proportions simply adds, for all future time, fresh uncertainty and new ground for friction. The direct sufferers are the shareholders, for the very character of the product of the Rand renders it impossible to pass the injury on to the purchasers of the product. Indirectly, no doubt, the mining houses may also suffer in their earnings of management. The most certain sufferers, however, are the men. The history of industry shows that a quick nemesis always follows on any quarrelsome or obstructive tendencies that have hindered in any way the full efficiency of the human energies and the material capital invested in any industry. That nemesis, which some of the miners of the Rand are now courting, invariably takes the form of a reaction upon the wages of the employed. The Rand miner who thinks he is going to improve his own position by worrying his management and causing much uneasiness and some loss to the shareholders is making the biggest mistake of his life. He looks round for encouragement and gets it only from the professional agitator, whose dignity and influence are, forsooth, at stake in the present quarrel. " Whom the gods destroy they first make mad." The miners have made a sad mistake. They have allowed themselves to be deluded by a parrot cry of comradeship, and have exposed themselves at the behest of the self-constituted leaders, to the ridicule of all sensible men. A point that must not be lost sight of is that even if the strikers win this battle it by no means follows that the mines will be able to re-engage as many workers as were on the companies' books previous to the declaration of industrial hostilities. Indeed, it is pretty certain that the industry by stress of economic considerations will not be able to re-employ the old complements of miners, fitters, etc. It is common knowledge that not a few mines on the Rand have for a long time been struggling with adversity. The disorganisation and expense resulting from the strike will probably sound the note of doom for some of these struggling properties, and it will doubtless be a very considerable time before they can hope to resume operations, if, indeed, it is decided to resume operations in the near future at all. This means that a large number of men will be permanently thrown out of employment. Are the strike leaders cognisant of these facts? And if they are, may we enquire if they have seen fit to enlighten their dupes on such an important matter? It may be news to many readers, but it is certainly not news along the reef that many of the Rand's best miners are now away at the coast enjoying a holiday. The exodus has a distinct bearing on the strike and on the circumstances in which many mines will find themselves when order and commonsense principles have been restored. The men who are now enjoying the sea breezes of Durban or the tranquility of the eastern Cape coast are the more sane of the Rand's miners, and since sanity and efficiency go hand in hand they are of the best that the Main Reef has in the way of skilled miners. Large numbers of these men, scenting trouble, have during the past weeks reported themselves to their managers, mine captains, and shift bosses, and have stated their intention of going away for a little change. Being men of reason and intelligence, they had no wish to be drawn into the vortex of the present upheaval, and they have temporarily absented themselves from the scenes of strife and delirious riot. They will return to their old billets when the clouds have rolled by, and no doubt the industry as well as they themselves will be all the better for their sojourn by the seaside. It is at least pleasant to think that not all the workers on a gold field where skilled labour is more highly remunerated than anywhere else in the world have taken leave of their senses.

The bearing of the present dislocation on the native labour question is, perhaps, most serious. As Sir Lionel Phillips stated at the Crown Mines on Thursday, "This is the most unjust strike on record. The men do not want to come out, and, if the men come out, we shall have to send the natives home. This will disorganise the native bureaux along the Reef. The natives will go away in a bunch, but they will only come back in batches; and it will be a long time before the men can be employed again, even after the strike is ended, owing to the scarcity of native labour." From this it is clear that the industry intends to pursue the only proper course in regard to the army of upwards of two hundred thousand natives on the Rand, viz., to allow them to return to their homes forthwith. The incredible folly and want of thought behind the strike can have no better illustration than this. With pumping disorganised and the natives dispersed to their homes, the mines cannot hope to re-employ the white men now going out for at least many months. Who will support them in the interval, and who will redeem their leaders' promises, remains to be seen.

The attitude of the Government, throughout the crisis, has been shockingly weak and inept. We entirely associate ourselves with the protest of the *Cape Times*, which, being furthest from the seat of trouble, can record recent happenings with unemotional commonsense. What this folly may cost the country may be judged from the fact that the mines of the Witwatersrand consume eleven millions sterling worth of goods per annum, and contribute about one and a quarter millions sterling to the revenue. What it will cost the mines may be judged from the fact that the 5,000 already on strike are losing wages to the value of £140,000 a month. The person who will suffer least, if indeed he suffers at all, is the Labour agitator's pet aversion, the so-called "mining magnate." It is earnestly to be hoped that even now at the twelfth hour the Government may awaken to the seriousness of the position and proclaim martial law from one end to the other of the Reef.

THE HALF YEAR'S DIVIDENDS.

Were it not for the strike, the Rand dividend aggregate for the half-year would be well over the four million pounds standard. As it is the total is £3,965,549. Both the East Rand Proprietary Mines and the New Kleinfontein mine are absent from the list this year. The former company has, on account of the strike, ceased milling for the time being, and has postponed the declaration of dividends, whilst the New Kleinfontein is also a non-declarant for the half-year. In June last the E.R.P.M. paid out 17½ per cent., or £305,736, and the New Kleinfontein 7½ per cent., or £72,750. Features of the table given in another part of this issue are the generally improved distributions of the "Eckstein" and "Barnato" mines, and the payment of £314,527 by the Randfontein Central, a company which declared its first dividend in December last, and thus did not figure in the June, 1912, list. Considering first of all the mines of the Central Mining and Investment Corporation, it is noticeable that the group total stands at £2,160,782, whilst companies with head offices in Natal controlled by the Central Mining and Investment Corporation distributed £142,250. For the corresponding period of last year these companies announced aggregate dividends totalling £2,001,030. Two important subsidiaries—the City and Deep and the Modderfontein B. with £156,250 and £140,000—figure in the present list, but since their first dividends were announced in December last were not included in the schedule for the fist half of last year. The Crown Mines, Bantjes Consolidated, Durban Roodepoort Deep, Geldenhuis Deep and Village Main Reef rates of payment remain at the same figure as in June last. The Ferreira Deep, by virtue of absorption of the Ferreira, has improved its distribution by £63,000; the New Modderfontein pays out £35,000 more, and the Village Deep distribution has advanced from £79,550 to £106,067. Owing to readjustment of date of declaration, the Nourse Mines has announced two dividends in the past half-year aggregating £151,767, as against one dividend—of £82,782—in the January-June period of 1912. Only one mine under full Corner House control announces a smaller distribution. This is the company which has paid out in dividends a larger amount than any other gold mine in the world—the Robinson. The decrease from £343,750 to £220,000 is due to reinvestment of funds, as the best years of the mine are over. As to the two Natal companies, the City and Suburban rate remains the same, but the New Heriot records a small decrease. Turning to the Gold Fields group, the Knights Deep's distribution of £80,441 compares with a similar amount for June, 1912. The Simmer and Jack Company's distribution also remains constant, as does that of the Robinson Deep, if the 2½ per cent. bonus for the first half of the current year be taken into account. The Brakpan Mines, as foreshadowed by Mr. Honnold, pays out 20 per cent., or £150,000, as against £112,500 in June last and £187,500 in December. The dividends declared by the subsidiaries of the Johannesburg Consolidated Investment Company reflect the steady improvement in profit that has characterised the monthly operations of mines under Barnato control for a considerable time past. Comparing these declarations with those announced a year ago, it is satisfactory to note that the New Unified is the only member of the four declaring companies that has not improved on its January-June, 1912, distribution. This company maintains, however, a 10 per cent. payment to shareholders. The Ginsberg pays out £36,750 as compared with £31,500, and the New Primrose £97,500 as against £81,250. The largest advance in amount falls to the credit of the Witwatersrand or "Knights" mine. The declaration by this company is of 25 per cent. as against 17½ per cent. in June of last year. Moreover, the capital is larger, £469,625 as against £425,000, and the net result in cash aggregate is £117,406 as compared with £74,375. Dividend prospects of this group for the end of the year are undeniably good, the more so inasmuch as the Consolidated Langlaagte may be expected to enter the dividend list before the end of 1913. The total for the "Albu" or General Mining group is £185,000, or £22,500 more than this time last year, the Meyer and Charlton paying out £10,000 more and the Van Ryn an additional £12,500. The Consolidated Main Reef, under "Neumann" control, distributes £46,218—the same amount as has been distributed for the past three half-yearly periods. As to the two other declarant companies of this group, the Wit. Deep distributes £82,500 as compared with £68,750, but the Wolhuter's disbursement has declined from £75,250 to £53,750. The Randfontein's large distribution has already been remarked on. The other mine of the "Robinson" group, Langlaagte Estate, pays out £66,487; more than in June last, but less than the December announcement of £86,950. The May Consolidated is the only representative of the "Goerz" group in the dividend list. Here, on account of the near approach of the end of the life of this fine old mine, the amount distributed is £14,438 (5 per cent.), whereas in June last £43,312 was paid out, and in December £28,875. As to the two independent companies, the Durban Roodepoort and "Jumpers," both these pay out the same amounts as in June of last year, viz., £12,500 and £5,000 respectively. Taking everything into account, this half-year's distributions must be regarded as very satisfactory, and as affording further evidence of the inherent stability of the Rand gold mining industry.

THE HALF YEAR'S DIVIDENDS.

A Grand Total for all Transvaal Mines of £4,538,778—The Rand, Despite the Strike, Records a Substantial Advance on the First Half of 1912.

Hereunder we give our usual six-monthly dividend list. The distributions contained in the accompanying schedules were declared during the six months ended with June 30th last and comprise all the mining enterprises of the Transvaal that announced dividends during the half year. Distributions of financial corporations are not stated, as these to a large degree duplicate the payments made by subsidiary companies. The totals for the half year stand as under:—

Gold Mines:	
The Rand	£3,965,549
Outside Districts	198,592
Diamond Mines	210,000
Collieries	112,237
Tin Mines	52,400
Grand Total	£4,538,778

Dealing first of all with Rand gold mines, the totals, according to controlling Houses or Groups, are as under:—

Central Mining and Investment ...	£2,160,782
Natal companies	142,250
Consolidated Gold Fields	455,441
Consolidated Mines Selection	150,000
Johannesburg Consolidated Investment	276,656
General Mining and Finance	185,000
S. Neumann and Company	182,468
Robinson	381,014
A. Goerz and Company	14,438
Independent Companies	17,500
	£3,965,549

For the corresponding period of last year the Group totals were:—

Central Mining	£2,004,030
Consolidated Gold Fields .	480,796
Farrar Group and Anglo-French Exploration Company	378,487
Consolidated Mines Selection . .	112,500
Johannesburg Consolidated Investment Company	212,125
General Mining and Finance . . .	162,500
S. Neumann and Company	294,557
Robinson	43,475
A. Goerz and Company	13,312
Independent Companies	12,500
	£3,744,282

For all Transvaal gold mines the increase is £279,629, and for the Rand £221,267. For outside districts gold mines the total is £198,592, an increase of £58,362, as compared with the first six months of 1912. The dividends from the Premier Diamond Mine are, taking both classes of shares, greater by £40,000, coal companies record an increase of £19,697, whilst the dividends of tin mines are less by £10,200. On the total distribution for all Transvaal mines, there is in comparison with the first half of 1912 an increase of £329,126.

Company.	Issued Capital	Date of Declaration.	Rate per cent.	Rate per Share.	Amount.	Total Distribution for Half Year.	Amount Half Year June, 1912.	Amount Half Year Dec. 1912
THE RAND.								
Central Mining and Investment Corporation.								
Bantjes Consolidated ...	£502,306	June	5	1s.	£25,115	£25,115	£25,115	£31,369
City Deep	1,250,000	June	10	2s.	125,000	125,000	—	156,250
Crown Mines	940,106	June	55	5s. 6d.A	517,058	517,058	517,058	517,058
Durban Roodepoort Deep	440,000	June	5	1s.	22,000	22,000	22,000	22,000
Ferreira Deep	980,000	March	25	5s.	245,000	245,000	182,000	220,500
Geldenhuis Deep	585,753	June	10	2s.	58,575	58,575	58,575	29,287
New Modder	1,400,000	June	15	12s.B	210,000	210,000	175,000	210,000
Nourse Mines	827,821	Jan.	10	2s.	82,782	151,767	82,782	41,391
	827,821	June	10	2s.C	68,985			
Modderfontein B.	700,000	June	20	4s.	140,000	140,000	—	140,000
Robinson	2,750,000	June	8	8s.D	220,000	220,000	343,750	275,000
Rose Deep	700,000	June	25	5s.	175,000	175,000	157,500	157,500
Village Main Reef	472,000	June	35	7s.	165,200	165,200	165,200	165,200
Village Deep	1,060,671	June	10	2s.	106,067	106,067	79,550	106,067
Companies with Head Offices in Natal, managed by the Central Mining and Investment Corporation.								
City and Suburban	1,360,000	June	7½	6s.B	102,000	102,000	102,000	102,000
New Heriot	115,000	May	35	7s.	40,250	40,250	46,000	46,000
Consolidated Gold Fields of South Africa.								
Knights Deep	643,526	June	12½	2s. 6d.	80,441	80,441	80,441	64,352
Simmer and Jack	3,000,000	June	7½	1s. 6d.	225,000	225,000	225,000	225,000
Robinson Deep	1,000,000	June	12½	2s. 6d.	125,000	150,000	150,000	125,000
	1,000,000	June	2½	6d.E	25,000E			
Consolidated Mines Selection.								
Brakpan Mines	750,000	June	20	4s.	150,000	150,000	112,500	187,500

Company.	Issued Capital.	Date of Declaration.	Rate per cent.	Rate per Share.	Amount.	Total Distribution for Half Year.	Amount Half Year June, 1912.	Amount Half Year Dec. 1912
JOHANNESBURG CONSOLIDATED INVESTMENT COMPANY.								
Ginsberg	210,000	June	17½	3s. 6d.	36,750	36,750	31,500	36,750
New Primrose	325,000	June	30	6s.	97,500	97,500	81,250	97,500
New Unified	250,000	June	10	2s.	25,000	25,000	25,000	25,000
Witwatersrand	469,625	June	17½	3s. 6d.	117,406	117,406	74,375	74,375
GENERAL MINING AND FINANCE CORPORATION.								
Meyer and Charlton ...	200,000	June	30	6s.	60,000	60,000	50,000	F70,000
Van Ryn	500,000	June	25	5s.	125,000	125,000	112,500	112,500
S. NEUMANN AND COMPANY.								
Consolidated Main Reef ...	924,364	June	5	1s.	46,218	46,218	46,218	46,218
Wit. Deep	550,000	June	15	3s.	82,500	82,500	68,750	68,750
Wolhuter	860,000	April	6¼	1s. 3d.	53,750	53,750	75,250	75,250
ROBINSON GROUP.								
Randfontein Central ...	4,193,700	June	7½	1s. 6d.	314,527	314,527	—	209,685
Langlaagte Estate	886,500	June	7½	1s. 6d.	66,487	66,487	43,475	86,950
A. GOERZ AND COMPANY.								
May Consolidated	288,750	June	5	1s.	14,438	14,438	43,312	28,875
INDEPENDENT COMPANIES.								
Durban Roodepoort	125,000	June	10	2s.	12,500	12,500	12,500	18,750
Jumpers	100,000	April	5	1s.	5,000	5,000	5,000	5,000
OUTSIDE DISTRICTS.								
NIGEL DISTRICT.								
Nigel	223,106	June	5	1s.	11,155	11,155	11,155	11,155
Sub Nigel	431,580	June	2½	6d.	10,789	10,789	—	21,579
BARBERTON DISTRICT.								
Sheba	269,738	Feb.	5	1s.	13,487	33,718	13,487	26,973
	269,738	June	7½	1s. 6d.	20,231			
LYDENBURG DISTRICT.								
Ceylon Lydenburg	22,600	June	22½	4s. 6d.	5,085	5,085	—	6,215
Glynn's Lydenburg	170,000	Jan.	10	2s.	17,000	17,000	17,000	25,500
Transvaal G.M. Estates...	604,225	Mar.	20	4s.	120,845	120,845	75,528	105,739
OTHER TRANSVAAL MINES.								
DIAMOND COMPANY.								
Premier (Def.)	40,000	June	400	10s.G	160,000	—	120,000	140,000
(Pref.)	40,000	April	125	6s..3d.H	50,000	210,000	50,000	50,000
COLLIERIES.								
Anglo-French	120,000	June	7½	1s. 6d.	9,000	9,000	4,500	7,500
Coronation	83,000	June	5	1s.	4,150	4,150	4,980	4,150
Clydesdale	180,000	June	5	1s.	9,000	9,000	—	9,000
Transvaal Coal Trust ...	545,760	June	10	2s.	54,576	54,576	40,932	68,220
Tweefontein	45,847	May	8¾	1s. 9d.	4,011	4,011	5,731	2,865
Witbank	210,000	Feb.	15	3s.	31,500	31,500	31,500	31,500
TIN COMPANIES.								
Rooiberg	180,000	June	20	4s.	36,000	36,000	13,500	27,000
Swaziland Tins	82,000	June	20	4s.	16,400	16,400	4,100	4,100

A Per 10s. share.
B Per £4 share.
C For five months ending June.
D Per £5 share.
E Bonus.
F Including £20,000 bonus.
G Per 2s. 6d. share.
H Per 5s. share.

MINE FATALITIES.

Rates for Different Countries—How the Transvaal and the United States Compare.

A YEAR ago the subject of accidents in Rand mines was discussed with spirit at meetings of the Chemical, Metallurgical and Mining Society. General and wide attention was bestowed on the matter, as the result of a paper read by Mr. J. Chilton, and the expression of views by men prominently connected with the industry—Mr. Kotze, the Government Mining Engineer, for example. Since those meetings, accidents inseparable from the routine of an industry such as mining on the Witwatersrand, have occurred with painful regularity, but the matter appears to have engaged very little notice of late.

MR. FAY'S TABLE.

The publication of a table compiled by Mr. Albert H. Fay, of the United States Bureau of Mines, serves, however, to redirect interest to this aspect of mining. In his table Mr. Fay gives a comparison of the number of men employed in metal mines of the principal countries showing the fatality rate per 1,000 men employed.* The compilation is as follows:—

Year.	Country.	Number employed.	Fatalities per 1000 employed.
	Australia:		
1911	New South Wales ...	19,363	1·81
1911	New Zealand	7,400	0·67
1911	Queensland	13,202	0·90
1909	Tasmania	6,051	0·99
1909	†Victoria	26,473	1·16
1911	Western Australia ...	16,596	2·23
1910	Austria	20,664	0·82
1910	France	18,542	3·16
1910	Germany	109,359	1·39
1910	German West Africa ...	6,933	1·30
1911	Great Britain	46,341	1·64
1911	‡India	143,336	1·18
1910	Japan	86,770	1·59
1909	‡Mexico	81,438	5·78
1910	‡Peru	20,410	5·78
1910	Portugal	6,551	1·68
1908	Russia	181,334	0·98
1909	Spain	96,901	2·25
1910	Sweden	13,775	1·23
1910	Transvaal	218,109	4·29
1911	United States	165,979	4·19

* Compiled from official reports. † Average for 20 years.
‡ Includes coal mines.

It will be observed that, excluding Mexico and Peru, the Transvaal, according to this list, has the unenviable distinction of being, from the point of view of fatality rate, the most dangerous metal mining country on earth. Mexico no doubt has a fairly well organised Department of Mines, but the suggestion that Peru is hardly a country in which one would look for accurate industrial statistics seems quite a reasonable one, and it will readily be admitted that accuracy is the prime essential of these figures. Indeed, without scrupulous correctness the statistics are worse than useless; they may cast grave and unwarranted libels on countries jealous of the lives of workers. This point was well brought out by Mr. S. Evans in a letter to this paper published some time ago. There is ample justification for insisting on absolute accuracy. The paper read by Mr. Chilton, already referred to, was a very interesting one, and undoubtedly directed timely attention to the question of accidents in mines of the Rand. The discussion resulting from the paper was also valuable, but apparently there was some confusion of accident rates with accident death rates.

U.S.A. AND THE TRANSVAAL.

Admitting, however, that Mr. Fay's statistics are correct, it may be observed that fatalities in the Transvaal in 1910 were 4·29 per 1,000 as against 4·19 per 1,000 for the United States in 1911. Apparently there was a slight reduction in accidents in the Transvaal in 1911. Quite likely that reduction was more apparent than real, but there seems to be every reason for holding to the view that in 1911 the fatality rates for metal mines in the United States and the Transvaal were much the same. America is the country for appalling train smashes, frightful calamities, and record-breaking facts and figures of every kind. Some may, therefore, argue that the Transvaal gains no credit through being bracketted with the United States in this matter. The majority of people are, however, inclined to take a different and more sensible view. Consider that in the Transvaal there are, roughly speaking, ten coloured employees for each white man on the books of the mining companies. These coloured employees constitute what is probably an agglomeration of the rawest and most unintelligent labour in the world. Moreover, it cannot be claimed for many of the white employees that they are highly skilled or long experienced miners. The Transvaal is not a country in which mining is an almost hereditary trade, and in which the bulk of the miners have been brought up in their calling. Generally speaking, miners here have not that inborn knowledge of the risks and dangers of their work that miners in older established mining countries possess. On the other hand the mines of the United States are run almost entirely by whites, and the majority of these white men are more skilled and experienced than the majority of Transvaal miners. Taking these facts into consideration and also the conditions peculiar to Transvaal mining, there accordingly appears to be every reason for a feeling of satisfaction at the similarity of fatality rates in the two countries.

MAY, 1913, STATISTICS.

Taking the official figures in regard to the Witwatersrand area for the month of May, we find that 24,162 whites and 206,698 coloured labourers were employed. There were killed during the month along the reef 8 whites and 55 coloured workers—a total of 63, or at the rate of 756 per annum, which, on the basis of 230,860 employees, gives a fatality rate of 3·27 per cent. Too much importance should not be attached to returns for one isolated month, but it may fairly be conceded that the above is very satisfactory and seems to suggest that the strenuous efforts put forth by the mines during the last year or two to improve the safety of underground workings and to lessen the chances of accidents are bearing fruit.

ACCIDENTS IN THE UNION.

In concluding this article, we give hereunder an official table of mining accidents for the Union of South Africa setting forth progressive monthly totals:—

Month.	No. of Separate Accidents.	Killed.			Injured.		
		Whites.	Coloured	Total.	Whites.	Coloured	Total.
1912.							
Year	3,124	69	962	1,031	359	2,300	2,659
September ...	272	8	100	108	29	199	228
October ...	257	8	78	86	28	193	221
November ...	245	7	74	81	31	169	200
December ...	247	6	86	92	22	173	195
1913.							
January ...	282	6	106	112	34	208	242
February ...	276	8	93	101	24	201	225
March	336	6	90	96	31	254	285
April	310	10	85	95	30	251	281
May	270	9	69	78	32	218	250

THE IDEAL LOT OF THE RAND MINER.

A Contrast with Conditions and Wages on Other Mining Fields—Higher Pay, More Congenial Climate, Less Work and a Larger Monthly Balance—What the Strikers are Risking.

TRANSVAAL mining labour is probably the most highly remunerated in the world. The white miners of the Main Reef series draw wages which must be the envy of workers in nearly every other goldfield on earth. In addition to the actual monetary awards, it can safely be asserted that on no other mining field in the world is so much regard for the welfare of the men shown by employers as on the Witwatersrand. Recognising to the full the truth of the old adage that "all work and no play makes Jack a dull boy," the much-maligned mine-owners have built up for their employees a social and recreation system that is not equalled elsewhere. The mine reading rooms, recreation halls and sports grounds of the Rand would come as a revelation to workers on most other fields. The model villages, containing comfortable and elegant little homes, the excellent boarding houses, the mutual benefit societies, and last but not least the system of selling to employees houses on freehold ground on the instalment system, that the workers may without financial embarrassment acquire their own homes, all these devices for the comfort and well-being of workers are without parallel in their excellence and ease of acquisition in the whole of the mining world.

Great Advantages of the Rand Workers.

The wages are high, the climate of the Rand is notoriously congenial, and the conditions for healthful and enjoyable relaxation after hours (which are no longer than on other fields) are remarkably good. It is ever true that familiarity breeds contempt. The mine workers of these fields appear to be dissatisfied with these conditions. They have obscured the issue of the reinstatement of the New Kleinfontein workers by the broader issue of an eight house' bank-to-bank day. As against the advantages noted above, their virulent leaders may allege that these favoured circumstances are neutralised by the ravages of phthisis and the comparatively high cost of living. Phthisis we all, unfortunately, know is a great evil on these fields. But it is widely recognised that the mines are doing everything humanly possible to stamp out this disease. Already much has been accomplished, and, with the loyal co-operation of the men themselves, a great deal more can be achieved. But phthisis is not the point at issue in this struggle. Neither is the question of wages the point at issue; even the most demented of the strikers must recognise that the money paid for the amount of work done is higher on the Rand than anywhere else.

Wages and Costs of Living on the Rand, Australia and British Columbia.

As to the cost of living it will be interesting to examine (a) the wages paid to workers on Rand gold mines; (b) wages on other mining fields of the British Empire; and (c) the comparative costs of the necessities of life in these districts. The following figures are abstracted from the last available report of the Union Department of Mines (Government Mining Engineer's report), and in regard to other Colonies from the latest and most reliable sources to hand. Taking miners pure and simple first of all, the average rates of pay on the Rand were:—

per day.

	s.	d.
Machine stoping:		
Contract	28	8
Day's pay	22	3
Hand stoping:		
Contract	26	11
Day's pay	19	6
Machine developing:		
Contract	35	4
Day's pay	20	2
Hand developing:		
Contract	27	6
Day's pay	19	0
Shaft sinking:		
Contract	50	5
Day's pay	25	0
Other miners (such as waste packers, etc.)	13	3

Other members of the underground force drew pay as under:—

	s.	d.
Shift bosses	25	2
Timbermen	20	10
Pipemen	19	4
Fitters	20	0
Platelayers (underground)	18	7
Drill packers and drill carriers (skilled)	13	1
Banksmen and onsetters	14	7
Skipmen	15	9
Trammers and gangers	14	0
Pumpmen	18	9
Underground engine drivers	20	5

Payments to fitters, engine drivers, etc., are also worth noting:—

	s.	d.
Foremen fitters	24	9
Fitters	20	2
Machinists and turners	20	6
Riggers, rope and wire splicers	20	6
Boilersmiths	20	2
Plumbers	20	2
Smiths	20	2
Drill sharpeners:		
Contract	26	6
Day's pay	21	3
Carpenters	20	0
Masons and bricklayers	20	2

Engine drivers:	Electric.		Other.	
	s.	d.	s.	d.
Winding	21	4	21	9
Mill	19	3	19	7
Compressors	19	4	18	3
Locomotive	18	9	20	4

Men employed on reduction and treatment plants have not figured to any extent in the strike yet. We give, however, official figures as to their wages:—

	s.	d.
Mill foremen	22	8
Amalgamators	18	4
Assistant amalgamators	13	5
Tube mill amalgamators	14	2
Millwrights	20	8
Fitters	20	5
Cyanide foremen	22	6
Cyaniders	16	9
Slimesmen	14	4
Tanksmen	11	8
Fitters	20	2

Turn now to the following figures for other mining fields: *Kalgurli, Western Australia* (eight hours shift):

	s.	d.		s.	d.
Miners: Day's pay	13	6		--	
Miners: Contract	15	6		--	
Mechanics	13	0	to	14	0
Mill hands	11	8		—	

Broken Hill, New South Wales:

	s. d.		s. d.
Miners: Day's pay	10 0		—
Miners: Contract	13 0	to	14 0
Mill hands	8 7½	to	9 6
Mechanics	11 6		

Bendigo and Ballarat, Victoria (mostly day's pay).

	s. d.		s. d.
Miners	8 0		—
Mill hands and mechanics	7 0	to	8 6

Waihi, New Zealand (mostly contract work):

	s. d.		s d
Miners	10 0	to	11 0
Engine drivers	9 0	to	10 0

British Columbia (Boundary District) (eight hours shift):

Wages vary according to strength of metal market With copper at about £100 per ton:

	s. d.
Miners	11 6
Underground labourers	11 6
Surface labourers	11 0

FACTS AND FIGURES THAT MATTER.

In Kalgurli the necessities of life for a single man cost about 27s. a week. The cost of living for a single man in the Bendigo and Ballarat fields of Victoria may be placed at 22s. per week. In the Boundary district of British Columbia workers are boarded at a dollar a day, and pay from 30s. to 35s. per month for accommodation. These rates of living are less than on the Rand, but, taking into account the housing and amusement facilities provided for Transvaal workers by the mining companies and the much higher wages paid the balance the Rand miner is, or should be, in possession of at the end of each month is overwhelmingly greater here than in the districts noted above. Moreover, the Rand miner does nothing like the amount of hard manual labour than his less favoured brothers in other mining fields have to do to earn substantially smaller pay. But the workers on the Witwatersrand are evidently not contented; either that or else they have been terrorised by a party of agitators who earn their livelihood by setting labour against capital. Were it not too late, we would earnestly counsel all those who are directly dependent on the mines of the Witwatersrand for their bread and butter to examine the facts and figures contained in the foregoing very carefully. No sane person can expect the mines to be run as vast philanthropic institutions. They have certainly done the square deal by their employees in the past, and if after this senseless riot is over—as it soon must be—there are many who look back on the pre-strike conditions with keen and bitter regret, they will only have themselves to blame for their loss.

OIL IN AFRICA.

Mr. Craig's Views—Question of Origin—Imperial Importance of Discovery in South Africa.

To strike oil is one of the ambitions of the Union at present. There have been indications in various parts of the country, chiefly imaginative ones, that have attracted attention and not a little capital for a long time past, but oil in payable quantities has not yet been struck. Going on the assumption that there can be no smoke without fire, the Government have decided to hold a thorough investigation into the various propositions that have been before the country. To that end, an expert of great experience and world-wide reputation has been brought to this country to visit the more likely places and report to the Government on the prospects. This expert, Mr. Cunningham Craig, is at present in Bloemfontein, after having travelled in the fascinating pursuit after oil. Mr. Craig has heard the call of oil in many countries, and it was only with difficulty that the Union Government were enabled to obtain his services—for a very limited period only. He will be able to remain in South Africa only for about four months, but during that time he expects to visit all the most likely localities. He starts shortly on a fortnight s tour of the Free State, and when he leaves the Province he will do the Transvaal, afterwards working his way down through Natal to the coast.

A MUCH-TRAVELLED EXPERT.

A representative of *The Friend* had a short interview with Mr. Craig the other morning, when from behind a high pile of papers, all dealing with oil propositions that he is expected to investigate, he let the pressman into some of the secrets of oil finding. He was able to speak with authority gained in many countries and under very diverse conditions. He has sought and found oil in Canada, in South America, in the West Indies, in Burmah, in Baluchistan, and in Persia, where he discovered the well-known wells now worked by the Anglo-Persian Oil Company. He has also been the head of the geological staff of the Burmah Oil Company, which last year made a profit of £1,000,000. He has had time in the course of his busy life to write a book on the subject of oil finding, "a small book, it does not pretend to be anything more than an introduction to the subject," he said modestly. Yet this small book caused something of a sensation among geologists and especially among chemists who theorise on the subject of oil in their studies. It is Mr. Craig's theory of the origin of oil that has given rise to so much controversy.

THE ORIGIN OF OIL.

"My view on the subject," said Mr. Craig, "is that oil is formed from vegetable matter, which under certain conditions forms coal, lignites, or carbonaceous shales, but under other conditions produces oil. I have found evidence in support of my theory all over the world. Within a few hundred yards I have found carbonaceous rocks and oil-bearing rock, and I could easily trace the difference. In England there would have been oil fields but for one or two adverse conditions. The coal there is found in basins, and the ground between was denuded in the early days. Yet recently natural fuel oil was found in deep coal workings. Here the coal-producing and oil-producing conditions had overlapped."

"What is the other theory of the origin of oil?" Mr. Craig was asked.

"Most practical geologists are now coming round to the opinion I have stated. The view which is held by theorists, by chemists rather than by geologists, is that oil owes its origin to animal matter, but very little attention was given to the subject, as it was regarded as having no practical importance."

SCIENCE AND WILDCATTING.

Mr. Craig regards the finding of oil as quite a simple matter. "If one is able to study the conditions thoroughly one can tell almost with certainty whether oil is likely to be found. One can tell the depth even to within a few feet. I have myself been able to state the depth at which oil was likely to be found about 2,000 feet below the turf to within ten feet on one occasion."

"But many great oil fields have been found simply by chance."

"In America most of the great oil fields were found as a result of wild-catting pure and simple, and I admit wild-catting is a good thing, but it wants a pile of money." Speaking of South Africa, Mr. Craig thought the country extremely interesting from a geological point of view. "In many ways the geology of South Africa is very simple, but it has some unique features as well, and many interesting problems. Geologically, the oldest parts of the country are at the coast, which is apparently the remains of a great southern continent. The inland portions are of much later origin."

PROSPECTS IN SOUTH AFRICA.

Of the oil prospects in South Africa, Mr. Craig was not inclined to say much. In reply to a question whether he believed there were any big oil fields in South Africa, Mr. Craig replied: "There are possibilities, but they are not very hopeful. I should not, however, like to give a decided answer to the question before I have seen a great deal more of the country. What we know is that an oil field in South Africa would undoubtedly be a great asset to the Empire, for the Admiralty is crying out for oil. Lord Fisher's Commission is at present inquiring into the 'problem of fuel for the Navy,' and I have myself given evidence before that body." Touching on the difficulties of oil finding, Mr. Craig said that in Burmah he passed over about 30,000 miles of country. He found traces of oil everywhere, but there were only a few spots, in areas of a few miles, worth tapping. In Trinidad there were about 600 miles where oil might be found, but only twenty miles can be productive. Among the places to be visited by Mr. Craig in the Free State are Kroonstad, Reitz, Bethlehem, Clocolan and Harrismith.

Blaauwbosch Diamonds.

The washing returns from the Blaauwbosch mine for the month of June are as follows: 8,300 loads washed; 1,634 carats recovered, or 19·68 carats per 100 loads.

OFFICIAL HISTORY OF THE STRIKE.

Authoritative Account of the Events that Led up to the Present Crisis—How the Trouble Grew.

The representatives of the gold mining industry have published the following authorised statement in regard to the origin and progress of the strike :—

The strike at the New Kleinfontein arose through the proposal of the management to make what was considered to be an unimportant alteration in the hours of five underground mechanics. These men formerly worked from 7 a.m. to 3.30 p.m. from Monday to Friday, and from 7 a.m. to 12.30 p.m. on Saturday. Under the new arrangement they were asked to work the same hours as the miners, with whose work their own was intimately connected—namely, from 7.30 a.m. to 3.30 p.m. every weekday, including Saturday. Considerable discussion and negotiation with the men took place, and the management finally decided on May 20 to make this change. Thereupon the men affected began an agitation among their fellow-workmen with a view to forcing upon the management a reversion to the former conditions of employment, and all the workmen finally decided on Sunday, May 25, to hold a ballot early on the following day on the question of striking. The ballot resulted in favour of a strike, of which fact the secretary of the Strike Committee, which had in the meantime come into existence, informed the management in terms of the following letter :—

Strike Committee Rooms,
Grand Theatre, Benoni,
May 26, 1913.

Manager,
—. Bulman,
Kleinfontein Gold Mine.

Dear Sir,—I am instructed by the above Committee to inform you that, acting on instructions from the men employed on the Kleinfontein Mine, a strike has been declared until such time as the following conditions are acceded to, viz. :

1. Reinstatement of all men concerned.
2. No Saturday afternoon work.
3. Working hours underground to be from 7 a.m. to 3.30 p.m., and from 7 a.m. to 12.30 noon on Saturdays.

Awaiting the favour of your reply,—I am, sir, yours, etc.,

(Signed) J. T. BAIN,
Secretary, Strike Committee.

It will be observed that this letter is signed by the Secretary of the Strike Committee, who was not an employe of the New Kleinfontein Company. No reply was sent to this letter, as the company was not prepared to treat with any officials or representatives of unions or other organisations who were not employes of the company.

THE FIVE UNDERGROUND MECHANICS.

The Board of the Company, however, reconsidered the alteration in the hours of the five underground mechanics, and, being advised that conceivably the method in which the alteration had been made might be in conflict with the Industrial Disputes Prevention Act, a notice withdrawing the alteration and giving one month's notice, in terms of that Act, of such alteration was posted the day the strike was declared. On May 27, the Chairman of the company had an interview with the Benoni Town Council, at the instance of the latter, which was in communication with the Strike Committee. At this interview the chairman of the company stated that he would always be pleased to meet representatives of employes to see whether an amicable settlement could not be arrived at, but he could only meet actual employes of the company. He also gave the assurance that there would be no victimisation of any men on account of the strike. On further consideration of the position, the Board of the New Kleinfontein Company, in a letter to the Deputy Mayor of Benoni, dated May 28, withdrew the notice of May 26, and agreed to revert to the hours in force on April 30, stating that if this offer were accepted it would be prepared to reinstate all its employes. The offer to meet a committee of employes was also repeated, as well as the assurance that no victimisation would take place. The Apex Mines (Gold Section) is under the same control as the New Kleinfontein Company, and on May 31 the strikers induced the men working on this mine to cease work. The men employed there were keeping the mine clear of water, and had it not been possible to keep the pumps going a large amount of valuable machinery would have been destroyed. On Tuesday, June 2, the Chairman of the New Kleinfontein Company met Mr. Murchie, who was an employe of the company, and also a member of the Strike Committee, at that gentleman's request. Unfortunately the meeting proved abortive, because this gentleman, while suggesting that the company should meet a committee of its employes, insisted that Mr. Bain should accompany them.

THE COMPANY'S OFFER.

As the offer made by the company in the letter to the Deputy Mayor of Benoni, a copy of which which was also posted at the mine, did not induce the employes to return to work, it was necessary that the company should take other steps to resume operations. As, however, it desired to give its old employes another opportunity of returning to work, a notice was posted at the mine on June 6, reading as follows :—

NEW KLEINFONTEIN COMPANY, LIMITED
(Incorporated in the Transvaal).
NOTICE.

1.—The board of the New Kleinfontein Company repeats the offer already made in the letter dated May 28, addressed by the Chairman to the Deputy Mayor of Benoni, and also posted on the mine, and has instructed the management :

(a) To reinstate every man who came out on strike or was discharged in connection with the dispute.

(b) To withdraw the notice posted on the 26th ultimo, and revert to the hours for underground mechanics in force on April 30.

2.—There will be no objection, should the majority of the miners prefer it, to starting and concluding the Saturday shift somewhat earlier than at present, on the distinct understanding that the full shift of eight hours at the face must be worked.

3.—The board is prepared at all times to meet a committee composed of the employes of the company, and repeats the assurance already given that there will be no victimisation either of the members of such committee or of any other employes on strike or discharged in connection with the dispute.

4.—The company will pay off at their offices on the mine all men on strike on Monday next, June 9, between the hours of 10 a.m. and 3 p.m.

5.—The above offer of reinstatement will only apply to those men who return to work on or before Wednesday, June 11, 1913, at the usual hours.

By order of the Board,
E. BULMAN,
Manager.

June 6, 1913.

It will be observed that this notice went even further than the letter to the Deputy Mayor of Benoni in the attempt to satisfy the strikers. Two days prior to the date by which the men were required to return to work in terms of the above notice an interview took place between the Chairman of the Company, accompanied by Sir George Farrar, and representatives of all the employes of the company. This interview did not result in any understanding being arrived at. Immediately after June 11 the company began to make preparations for the resumption of work, and to engage men to replace those on strike. On June 17 the Chairman of the New Kleinfontein Company met a deputation of ex-employes of the company representing various departments. The deputation agreed to accept the terms as offered in the notice of June 6, but insisted upon the unconditional reinstatement of every man out on strike. Between June 11 and June 17, however, the company had engaged some fifty men to replace strikers, and the Chairman pointed out that the demand for unconditional reinstatement was therefore impossible of fulfilment, as the company was pledged and in honour bound to stand by these men. He offered, however, to re-employ every man he possibly could, and further proposed that where any vacancies occurred in the future these vacancies should be filled as far as possible from a list of former employes of the company, and even went so far as to offer to try to obtain employment on other mines for those who could not be re-employed by the New Kleinfontein Company. This offer was submitted by the deputation to the strikers, who rejected it.

AT THE VAN RYN ESTATES.

On June 19 certain of the strikers and members of the Strike Committee went to the mine of the Van Ryn Estates before the shift went down in the morning, and a ballot was taken on the question of the mine going on strike. The result was that 127 voted against and 80 in favour of striking. In spite of this result, the Van Ryn men were intimidated into going out on strike. On June 20, the day after the strike occurred at the Van Ryn Mine, certain of the strike leaders were arrested, and this was the first occasion on which proceedings were taken under the Industrial Disputes Prevention Act. On Saturday, June 21, the New Modderfontein Mine was visited by the strikers, and its employees were induced to come out without having been given an opportunity of taking a ballot. On June 20 the Government published a notice to the effect that in terms of Law 6 of 1894 (Transvaal), Section 9, assemblies in squares and streets of more than six persons within the Municipality of Benoni were prohibited. Nevertheless, on Sunday, June 29, a mass meeting was allowed to be held in Benoni, and special trains were run by the railway to take sympathisers from other parts of the Reef to the meeting. It is worthy of note that a circular was spread broadcast along the Reef inviting men to come to this meeting armed, and an advertisement in the same terms was also published in a section of the local press. At this meeting, at which several thousand persons were present, many inflammatory speeches were made. On Monday, June 30, mobs of strikers began marching along the Reef, and by means of speeches and threats have since induced the men on many of the mines, and also at some of the power stations of the Victoria Falls Power Company, to come out on strike, with the result that over half the industry is paralysed.

THE YEAR WITH THE T.G M.E.

Points from the Reports—Results of Prospecting—Progress of the Mines—New Power Station Gives Satisfaction.

In submitting the reports of the resident managers of the Central, Elandsdrift and Vaalhoek mines, together with general remarks and summary of the T.G.M.E. Company's operations for the year ended 31st March, 1913, the general manager writes:—

PROSPECTING OPERATIONS.

Klipkraal, No. 460.—During the greatest part of the year, in compliance with the wish expressed by the Government, prospecting operations have been continued on this farm, but as absolutely no values have been disclosed, either in the quartz reefs, which occur below the berg in the granite boss, or in the sandstone reef in the sedimentary formation above, this work has been stopped. During the year, 675 feet were driven, risen and sunk, making, since beginning operations, the large total of 6,687 feet, and, in addition, there were 10,495 feet of cutting and trenching.

Hermansberg, No. 1035.—Very extensive prospecting operations have been continued on this farm. Between the "Beta" and "Theta" horizons, on the nek adjoining Frankfort, the very large mineralised deposit, mentioned in last year's report, has been thoroughly prospected. The encouraging nature of the values disclosed here and there led to very extensive operations, without, however, enabling the selection of any payable proposition. The same gang was taken from this work to do more prospecting on the mineralised ore bodies alongside the Vaalhoek dyke and on the horizons of the "Glynn," "Willemsoord," and other reefs, but without any success. During the year 1,685 feet were driven, risen and sunk, which, added to the amount previously done, makes the large total of 3,829 feet to the end of the financial year, besides a great deal of cutting and trenching.

Oliphantsgeraamte, No. 459.—The prospecting work which was being done on the "Theta" horizon, although showing now and then encouraging assays, has failed to disclose as yet anything of a commercial value. While this work was going on, another reef in a much lower horizon has been located; the good values obtained here have justified the transfer of the whole prospecting party to this new disclosure. This reef, which is in dolomite formation, is interbedded between the dolomite and an intrusive sheet of diabase. There is every justification in hoping that our efforts here will meet with some measure of success. During the year 2,113 feet were driven, 58 risen, and 35 sunk, making a grand total of 3,690 feet accomplished to the end of the year.

Kliprots, No. 614, *and Finsbury, No.* 621.—Some work has been done here since September, and, altogether, several miles of outcrops, probably belonging to the "Davidson," "Button," and Sandstone reefs, have been located, but, unfortunately, the exposures are most discouraging, both in thickness and in values. These reefs belong to the shale formation, in which, up to now, no payable proposition of any magnitude has as yet been located in the district. 16,793 feet of cutting, and 7,478 feet of trenching, were done. The total amount expended on the prospecting works enumerated above was £3,430 17s. 1d., which was all charged to the Central Mines, thus increasing their working cost by 5.53d. per ton milled.

DEVELOPING AND MINING.

Central Mines.—The most important feature of the year's work has been the replacement of the Clewer Mine by Duke's Hill South, which is entirely situated on the farm Ponieskrantz.

Duke's Hill South.—The Morgenzon Concession, the workings of which were known as the "Clewer" Mine, expired on the 5th May, 1913; previous to this date all payable ore had been extracted from the mine. It is indeed fortunate that the section of this mine known as the Duke's Hill Channel should have proved so valuable in its extension in "Ponieskrantz." About 1901 the old Duke's Hill Channel came to an end, and, although every effort had been made to locate the extension of this ore body, it was only towards the beginning of 1911, and at a distance of about 600 feet from the old channel, that a similar deposit made its appearance well within the boundary of the farm Ponieskrantz. Although it was desirable to push the development of this new disclosure, many difficulties were in the way; the working faces were 3,000 feet from the mouth of the adit, causing great difficulties of ventilation, and, to make matters worse, a fault causing a downthrow of about 30 feet was met with. The extent of this ore body being unknown, it was not advisable to instal, just then, a proper hoisting plant, and things had naturally to proceed slowly. However, while this low section was being developed, a new adit was being put in from Duke's Hill South in Ponieskrantz, a distance of 600 feet, to serve as an airway for the new workings, and with the most important object of securing at the same time a shorter travelling way to the surface, independent of any from the Morgenzon Concession. This connection was made at the end of last year, greatly improving conditions. Since then a new tram line and incline have been built to connect with the Main Line, and the close of the year under review, having seen the end of the "Clewer," the electrical hoists which were operating there have been re-erected at this new mine, thus successfully accomplishing its substitution in place of the "Clewer." The Duke's Hill South Mine is now being developed, in conjunction with Columbia Hill, and, at the end of the year now under review, the distance between these workings was 800 feet only. Although nothing is known as to the value of the intervening ground, there is little doubt as to the lode extending between these two mines, and connection between them should be made during the present year.

Peach Tree Mine.—This mine, though not quite up to expectation in its development, is being followed up with the keenest interest. During the year a very large ore body has been located above the incline shaft, which was being sunk to develop the ground to the dip. This ore body, which is of very good appearance, shows the greatest unconformability as yet disclosed in our mines. An unpayable quartz blow of enormous proportions and highly mineralised has been passed through in the vicinity of plutonic intrusions, which are, no doubt, responsible for the unconformability of the strata at this point. Both the drives now proceeding, respectively, towards the dip and in the direction of the Duke's Hill South, are opening up an ore body of the same appearance as that of the Duke's Hill Channel, but, unfortunately, unpayable so far. It is hoped, however, that here, as in Duke's Hill South, this unpayable zone will become a valuable asset with its extension towards the dip. The drives to the east of the "Beta" dyke have opened up very favourably.

Theta Mine.—As usual, this mine has contributed the richest ore to the mill, while, in the upper reef mentioned in last year's report, some good disclosures have been made from time to time. It is probable that a large portion of this reef is still untouched. A good reef has also been located in the east portion of the Hill, which was supposed to be barren. The Theta Extension has disclosed indifferent values in the most southern portion of the Hill towards the Government farm "Graskop," and work has been discontinued, while on the portion of these workings immediately adjoining the Theta Mine, work is still being carried on.

Graskop Mine.—This mine latterly has yielded values considerably higher than those indicated by the assay plan, and its development is proceeding satisfactorily. The lower section has been connected with the tramline by an incline and mule whim. It is perhaps well to mention here that both at the Theta and Graskop, owing to the irregularities of a very soft strata, the cost of timbering is very considerable, and development work has to be limited and but little in advance of stoping operations. Some work has been done in the further development of the Columbia Hill Shale Reef, where the small tonnage of rich ore available may be realised by connecting up with the Peach Tree line, when the exploitation of this patch of reef will receive more attention. Brown's Hill has been reopened and retimbered, and development operations are proceeding satisfactorily.

At an early date it may be deemed advisable to link up this mine by means of an incline and tramline, with the Peach Tree main line. The reef which is opened up at Brown's Hill is, in my opinion, the Theta reef belonging to the intervening country between the Theta and Peach Tree mines, where the strata has been down-faulted between two main dykes, one on the west side of the Theta mine, and the other probably following the course of the Blyde River. For the purpose ot locating this portion of reef, which, though considerable in extent, is certainly badly faulted and broken up, two adits are being put in from the Pilgrim's Creek, hoping by this to be able to drive on through reef in a southerly direction and on the strike of the reef.

Elandsdrift Mine.—The quartz blow has opened up and yielded as well as ever. With the completion of the hydro-electric power plant and the installation of the mine pumps, a fresh start has been made in the development of the dip section, where operations are now being pushed. Although the new pumping plant has been operating only since November last, it is pleasing to note that encouraging values have been disclosed. Should this section continue to open up well, an extension of the crushing plant at this mine may become advisable.

Vaalhoek Mine.—It is gratifying to be able to place on record a great improvement at this mine. Some good disclosures have been made in the Nek section, while the River section has opened up remarkably well. Owing to the large amount of water met with in this section, it was found necessary to instal a small pumping plant, which will now enable the management to push development operations with renewed vigour.

ORE RESERVES.

Central Mines.—It is pleasing to note that, notwithstanding the increased tonnage put through the mill, the ore reserves have increased by 35,828 tons, while the average value per ton remains virtually the same. The reserves, estimated as at 31st March last, were 385,547 tons, valued at 14.23 dwts. per ton. There are in addition small quantities of payable ore available in outside prospecting propositions totalling 12,832 tons, but these have not been included, as they could only be utilised if reduction plants were available in the immediate neighbourhood.

Elandsdrift Mine.—There is an improvement in the ore reserves, which were estimated as at the close of the financial year at 30,210 tons. A statement as to their satisfactory value will be found in the Resident Manager's report.

Vaalhoek Mine.—It is gratifying to place on record that here, too, the ore reserves have improved both in tonnage and in value, and stood at 31st March at the figure of 40,892 tons, valued at 10.36 dwts. per ton. There are in addition 2,070 tons of ore on dumps valued at 10 dwts. per ton.

Working Expenditure and Revenue.—The profit on working for the year was £277,950 12s. 3d., arrived at as under :—

	Revenue.		Working Cost.	Profits.
	Total. £	Per Ton Milled.	Total. £	Total. £
Central Mines	£407,180	54/9.62	£161,884	£245,296
Elandsdrift Mine	36,588	93/9.23	12,329	24,259
Vaalhoek Mine	25,860	31/7.47	17,465	8,394
	£469.629	54/4.41	£191,678	£277,950

The decrease in the working costs at the Central Mines, compared with the previous year, is 1s. 8.69d. per ton milled, and is due mostly to the larger tonnage crushed. At Elandsdrift, the abnormally large amount of development done on the Dip section is chiefly responsible for the increase in working costs. It will be apparent that on the small tonnage milled at this mine, every extra £100 spent per month means about 2s. per ton milled. Vaalhoek costs were down 1s. 2.87d. per ton milled, owing chiefly to the larger tonnage crushed. The decrease in costs over the three mines is 1s. 3.7d. per ton milled.

Accumulated Slimes.—The accumulated slimes which were lying at the "Clewer" Mine have been practically all treated, and a profit of £8,736 8s. 9d. was realised from this source, which is additional to the profit shown above.

Tributors.—Some work on leaders has been done, and is being continued on the farm "Hendriksdal," No. 216, on the same portion of "Rosshill" which was worked in the old days. This work has been mostly of a prospecting nature, and a small amount of £3 2s. has been added to general revenue from this source. At "Belvedere," No. 1341, prospecting work on a small scale on leaders is being carried on.

GENERAL REMARKS.

Mining timber has always been a very important item of expenditure. During the last three years the consumption in loads and cost was: 1910-11, 2,191 loads at a cost of £12,890; 1911-12, 1,501 loads at a cost of £10,726; 1912-13, 1,077 loads at a cost of £7,760. During the last quarter of the past year the consumption has been reduced to an average of 47 loads per month at a cost of £3 8s. per load only. These gratifying results have been obtained chiefly by keeping the reef in the roof of the development drives, so that the hanging wall is not cut through, and stoping operations can be carried out with little or no timber. It is perhaps well to mention that at the "Theta" and "Graskop" mines, where the strata is soft, very large quantities of timber are still required, while at the Peach Tree mine, Columbia Hill, and Duke's Hill South, where the strata is solid, practically no timber is now being used. The Belvedere Power Plant has worked very satisfactorily, and has proved a most valuable asset. During the past exceptionally dry season, it was due to this plant that the whole of the reduction works were kept continuously running. I may safely state that this plant has paid for itself already, its total cost being more than covered by the consistency in profit it has allowed. Although in the early part of the season the rainfall has been very low, so that water in the Blyde River was barely enough for the requirements at Belvedere, during the last few months, up to the time of writing, there have been steady rains, and the rainfall now recorded is larger than for the same period in the previous year. The railway from Nelspruit during the year has been opened as far as Rosehaugh, and, in a few months, it is expected to reach Sabie. This construction is, however, proceeding very slowly, and the line is not expected to be opened to Graskop before the early part of 1914.

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of May was as follows:—Gold won, 390 ozs. 7 dwts. (fine gold); tons crushed, 1,747; value, £1,639 5s. 11d. Concentrates (estimated): Gold recovered, 55 ozs. 13 dwts. 19 grs. (fine gold); tons treated, 10·3; value, £236 13s. 11d.; silver and lead value, £84 6s. 5d. Cyanide: Gold recovered, 57 ozs. 7 dwts. 5 grs. (fine gold); tons treated, 742; value, £240 17s. 9d.

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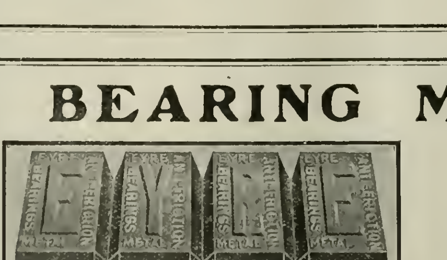

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LAST YEAR WITH THE GOERZ GROUP.

Mr. H. Neuhaus Exhaustively Reviews Recent Progress—Bettering Health Conditions—Native Labour Questions—Improved Position of Geduld—Latest Development at the Modder Deep.

Mr. H. Neuhaus presided at the annual meeting of Messrs. A. Goerz and Co. The accounts, he regretted to say, were of an unfavourable nature. Dealing with general aspects of Rand affairs, he said, *inter alia*:—" While, as has been stated, 1912 was a very unfavourable year for mining finance, it was by no means so for the Rand mining industry regarded from the point of view of material progress made. Indeed, in several important directions, and particularly in organisations, a notable advance was registered, which must bear very good fruit in the not too distant future. A perusal of the able review of the mining industry given by your consulting engineer in his annual report will have shown you that the tonnage crushed, the yield per ton, and the profit, as measured by dividends, all registered an increase in 1912. The average costs for that year, at 18s. 8d. per ton milled, showed an increase over 1911 of 8d. per ton, and of 1s. 7d. as compared with 1909, the year in which the lowest average costs have hitherto been obtained. In the main this increase was due, as has so often been stated, to the greater cost of labour, while contributory causes are to be found in the stricter regulations relative to the working hours of underground employees and the large expenditure incurred in making mining work more healthy. I agree, however, with your consulting engineer in thinking that the high-water mark of costs was reached last year. But as costs fall the tonnage giving a margin of profit, of course, increases, and thus causes the yield per ton to fall to a certain extent. As, however, it must clearly be our aim to make the greatest possible quantity of gold-bearing ore contained in a mine profitable to treat, it is of paramount importance to bring about a reduction in the working costs. It is from this point of view that in future the work done in 1912 may well be considered as the forerunner of better things. Indeed, the average costs per ton for the first five months of the current year show a decrease of 9d. per ton milled on the 1912 figure, so that the industry has already made up half the leeway lost during the last few years, and this, in spite of the fact that the cost of providing compensation for sufferers from miners' phthisis is now being met and absorbs very nearly 4d. per ton milled.

Diminution of Working Expenses.

" The diminution in working expenses is naturally due to many factors, but one of the most important I take to be better organisation, for which the seed was sown last year, when nine out the ten groups responsible for practically the whole industry agreed to stop competing against each other for native labour and formed the Native Recruiting Corporation, which started work on the 1st of October last. This corporation has so far been successful in its operations, and I have no doubt that it will continue to be so in an increasing degree. The spirit of co-operation displayed by the groups in the formation of this corporation did not die with the commencement of its operations. On the contrary, it has steadily gathered strength, and the mutual confidence engendered by working together in this important branch of the industry's activities has enabled us to tackle many problems common to these fields, and by united action to achieve reform where previously it was practically not possible to do so owing to the fact that common action was essential. As your consulting engineer points out, the efficiency of the labour employed—both white and black—leaves much to be desired, and it is just in these directions that co-operation should prove extremely beneficial.

" Ever increasing attention is being paid, and rightly so, by all parties concerned to improving the health conditions of the mines. No expense is being spared to decrease the incidence of miners' phthisis, and I am assured that the condition of the mines in this respect has improved out of recognition during the last twelve months. Similarly, every effort is being made to lessen the incidence of pneumonia, particularly by resorting to inoculation. Unfortunately it has not yet been found possible sufficiently to reduce the rate of mortality among the natives drawn from tropical areas. Under the circumstances the Government prohibited the introduction of further natives from these districts, and recruiting has therefore been stopped for the present. Though during the last recruiting season some fifteen thousand of these natives were introduced, I trust that the increased supply from other areas will balance this deficiency. In this connection it must be remembered that the number now on the mines will only leave gradually as their contracts expire. Great efforts have also been made to lessen the number of accidents which taken place, and the fact that the death rate from this cause for 1912, for whites and blacks combined, was reduced to 3·9 per thousand per annum demonstrates that a good deal has already been accomplished in this direction. As some evidence of the care with which the mines in which you are directly interested are managed, it is gratifying to note that, taken as a group, they registered last year the lowest death rate from accidents of any group, namely, 2·69 per thousand per annum. I would point out that these figures compare very favourably with the death rate from accidents in the metal and non-metal mines, excluding coal, of the United States of America, in which country in 1911 166,000 men were employed, and the death rate from accidents was 4·19 per thousand per annum. Working costs have also benefited by a reduction in railway rates on material and particularly coal." Mr. Neuhaus added that in another year's time it is expected that the Victoria Falls Power Co. will increase to 140,000 k.w. and the air compression to 61,500 k.w., or 50 per cent. higher than the figures at the end of the year. Reference was made to the all-round improvement at Geduld, the enlarged and modernised plant of which will crush 24,000 tons monthly. It is intended to shut down for a few days in order to put the new plant into commission. At Modder Deep 6,350 feet have been sampled, giving 7·6 dwts. over 48·6 inches, payable and unpayable. Improvement has recently been shown at the Princess Estate.

An Important Sale.

Mr. J. C. Burchmore announces an important sale of a block of ten siding stands, Denver, immediately beyond Messrs. Hunt, Leuchars and Hepburn's yard, on Wednesday, 16th July, 1913, at 11 o'clock. Stands Nos. 394 to 403, Denver, form a valuable and compact block with about 300 feet frontage to the Main Reef Road, and within easy distance of the centre of the town. This is one of the very few available blocks of ground abutting on the Railway and with siding privileges.

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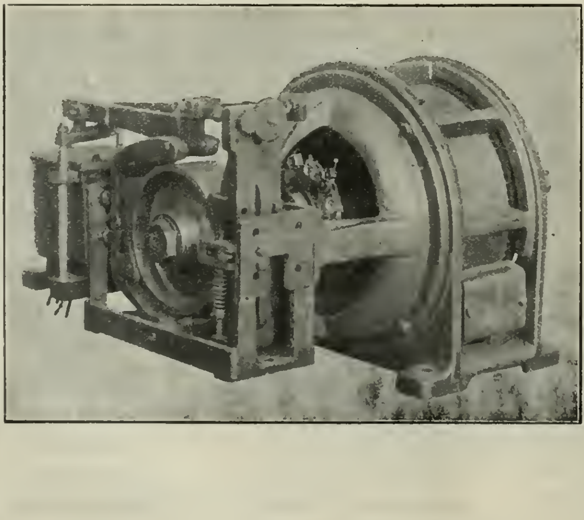
CERTIFICATES OF COMPETENCY.

Government and Mine Officials—Kimberley Under the Regulations.

When gold mining on the Rand was an infant industry and the mines were of little depth and small area, their working was of such a comparatively simple nature that it mattered little what the qualifications of the manager and staff were, and, as on many other young mining fields, these qualifications were at first largely conspicuous by their absence. But as time rolled on and the immense potential wealth of the fields began to dawn on us our mines by a process of absorption and amalgamation extended their areas and milling capacities, and thus slowly but steadily evolved the conditions of to-day when the Rand presents the greatest centralized gold mining industry the world will probably ever see—an industry which is the greatest asset of South Africa. To enable the maximum profit to be extracted from our unique auriferous deposits, and thus expand to the utmost the zone of payability, science in all its developments is being laid under tribute, and the highly trained mining, metallurgical, mechanical and electrical engineers are working side by side to this end. The day of the untrained man is passing; the present problems and requirements are beyond him, and the safety of our workers demands that officials shall be competent by virtue of both training and experience to safeguard the lives under their charge. To achieve the best results both as regards safety and otherwise, we require intelligent and competent men, and to ensure this it has for some years past been necessary for mine officials and others in the Transvaal to obtain Government certificates of competency. This wise provision has worked admirably here and now, under the Act of Union, it will be applicable to other South African mining fields, including Kimberley. Writing on this subject, the *Diamond Fields Advertiser* says:—

> The regulations relative to certificates are now being enforced throughout the Union of South Africa, and Professor Yates, of Johannesburg, has been requested by a number of mining men to open preparatory classes in Kimberley in this connection. The School of Mines has been placed at his service. Professor Yates, during his tenure of the Chair of Mining at the Transvaal University College, did much for the cause of mining education on the Rand, and the success of his scheme of reef lectures far surpassed the most sanguine expectations. Educated in Lancashire, he carried off the Pendleton Scholarship, Heywood Exhibition, and National Scholarships, and was twice prizeman for Lancashire and Cheshire in Machine Calculations. Proceeding to the Royal School of Mines, he became a first-class associate, and obtained first-class honours in mining, being placed at the head of the list for the United Kingdom for the year. He is a Fellow of the Geological Society of London, being proposed by Professor Judd, Dean of the Royal School of Mines, London, an M.I.M.M., a certificated mine manager of the Transvaal, and a past President of the Chemical, Metallurgical, and Mining Society of South Africa. After six years with a power company in the North of England, he proceeded to India as mine manager, and on his return to Great Britain was made engineer and chemist to the patentees of the cyanide process, by whom he was afterwards transferred to Johannesburg as engineer and metallurgist to the African Gold Recovery Co., thus being the technical expert for the cyanide patentees in South Africa. Subsequently Mr. Yates became mine manager and assistant consulting engineer to a large mining group on the Rand, and was appointed Professor of Mining at the Transvaal University College. We regard Kimberley as fortunate in having secured his services, and trust that a large number of students will enrol and thus best express their appreciation.

Few men are better or more favourably known on the Rand than Professor Yates, and we therefore also congratulate Kimberley on securing his services, especially as we understand that these new duties will in no way interfere with his work in Johannesburg.



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Rhodesian Section.

LATEST MINING NEWS.

The May Output—Eldorado's Troubles—Mashonaland Agency—Heroine G.M. Co.—Amalgamated Props.—The Gaika—Pickstone Gold Mines—Rhodesia Mines Trust—The Falcon Mystery—The Pickstone—Labour Statistics.

The total value of Southern Rhodesia's mineral output for the month of May, full details of which are published in this issue, has been officially declared at £264,151, as compared with £260,453 in April. The figures for the two months read as under:—

	April.	*May.*
Gold	£241,098	£242,452
Silver	1,246	1,529
Lead	483	604
Chrome iron	11,500	8,361
Coal (sales)	6,017	6,257
Diamonds	109	4,945
Totals	£260,453	£264,151

Included in the diamond output declared this month are £4,135 worth of stones not previously declared, the actual yield for the month having been valued at £810, as compared with only £109 in the preceding month. The gold yield marks an advance of 570 ozs. in weight and £1,354 in value, as compared with the shorter month of April, and the increase as compared with the corresponding month of 1912 amounts to 2,201 ozs. in weight and £8,044 in value. The output for the first five months of the year is £75,000 in advance of that for the like period in last year. This fact in itself is sufficiently encouraging, and when it is remembered that during June the first month's declaration from the Kimberley Reefs is due to come in, one may look forward hopefully to the present scale of output being maintained.

* * * *

We are officially notified that in view of the caving-in of certain stopes on the Eldorado mine, it has been decided to reduce the milling grade of the ore to 8 dwts. for a period of six months from 1st July next, when the position will be further considered.

* * * *

The Kimberley (Mashonaland) Gold Mining Company, Ltd., in which the Mashonaland Agency, Ltd., has a two-thirds interest, reports that the mill on their property in the Enterprise district started on May 7th. Small financial results are anticipated during May, improving in June to full results in July.

* * * *

The 10-stamp mill supplied by Messrs. Fraser & Chalmers for the Umsweswe property of the Heroine G.M. Co. has now been erected, and had a trial run recently. The plant was erected by Mr. W. A. Carter, of Bulawayo, and is one of the most up-to-date plants ever erected in Rhodesia. Regular crushings will commence from 1st July. Over 2,500 samples have been tested from this property, with quite satisfactory results.

* * * *

For some time past, writes the Salisbury correspondent of the *Rhodesian Mining Review*, there has been a good deal of local buying of Amalgamated Props., from which it is evident that very considerable interest is being taken in the undertaking in Salisbury. That the company is vigorously working on their mining properties in the Hartley district goes without saying; and, in view of its immense holdings in land, the recent fall in the shares is a matter which no one seems to be able to understand. A few months ago Mr. Dickinson, A.R.S.M., one of the directors of the company, spent a considerable time in the country, examining its numerous properties; and this visit, coupled with the fact that Mr. Bonnard, the chairman of the company, is coming out in the course of a few weeks' time, lends considerable colour to the suggestion that the board are leaving no stone unturned to develop to the best advantage the properties they control.

* * * *

The following is taken from the report of the Gaika for the quarter ended March 31:—Ore reserves: The total tonnage developed at March 31 is estimated at 67,464 tons at 14·44 dwts. per ton, being a decrease of 74 tons and an increase in value of ·4 dwt. per ton. Ore crushed, 8,288 tons; value of bullion recovered, £13,654, equal to 32s. 11d. per ton; cost per ton, 28s. 10d.; estimated profit, £1,698, equal to 4s. 1·18d. per ton; development account, £3,635; capital expenditure, £1,132.

* * * *

The following information is gathered from the manager's report of the Pickstone Gold Mines for the month of May:—The development work done during the month was 214 feet. The new main vertical shaft at Pickstone West was sunk a further 38 feet, making a total depth of 108 feet. The water difficulty here has been apparently overcome, and the contractors are progressing more rapidly with the sinking. The average pan values of development work for the month was 18 dwts. over 18 inches. 1,268 tons of ore were crushed, yielding £2,885 11s. 8d., which resulted in a working profit of approximately £1,572.

* * * *

The accounts of the Rhodesia Mines Trust for the year ended September 30 show a loss for that period of £1,619. The report states that the directors have given very careful consideration to the position and prospects of the company, and have consulted with the Gold Fields Rhodesian Development Company and Rhodesia Consolidated, whom between them own no less than 219,112 shares. A short time ago it had been decided to recommend that the company be wound up and its assets distributed amongst the shareholders, but in view of the favourable developments on the Elgin claims the directors now propose that the company be continued pending further developments of the claims.

* * * *

The Falcon Company announces that "a cable has been received stating that Messrs. Ackermann and Pickering, having received permission to examine the mine," have thrown doubt on the correctness of the assay plan. In view of the frequent sampling and check sampling during several past years, both by the officials of the company and other independent engineers, the board feel confident that former reports of assay results are correct. Further checking assays are being made by the local management, and the results will be published as soon as received. At December 31 the reserves were estimated at 805,783 tons, valued (with copper at £56 per ton) at 52s. 5d. per ton, or a total of £1,933,225. Taking copper at £66 per ton, the reserves would be valued at 6s. per ton more.

* * * *

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of May contains the following summary of the returns of native labourers employed on Southern Rhodesian mines during the months of March and April, 1913:—

	March.		*April.*
Local	11,098	......	11,627
Portuguese Territory ...	5,790	......	5,730
North-Western Rhodesia ...	3,088	......	2,924
North-Eastern Rhodesia ...	5,609	......	5,528
Nyasaland	5,862	......	6,009
Other sources	917	......	954
Totals	32,364	......	32,772

The number of natives employed in April shows a decrease of 4,973 when compared with the corresponding month of 1912.

* * * *

The following information is gathered from the manager's report of the Pickstone Gold Mines for the month of May:—The development work done during the month was 214 feet. The new main vertical shaft at Pickstone West was sunk a further 38 feet, making a total depth of 108 feet. The water difficulty has been apparently overcome, and the contractors are progressing more rapidly with the sinking. The average pan values of development work for the month was 18 dwts. over 18 inches. 1,268 tons of ore were crushed, yielding £2,885 11s. 8d., which resulted in a working profit of approximately £1,752. The water difficulty has been apparently overcome, and the contractors are progressing more rapidly with the sinking.

Zinc Dust Precipitation.

The continued and increasing use of zinc dust as a precipitant for gold solutions in the cyanide industry is gradually extending our practical knowledge of the operation, even though all the chemistry involved may not be definitely known. As in the development of any novel process, the original advocates of zinc dust precipitation hedged the method about with certain precautions and restrictions which were dictated by their best judgment and reason. But likewise, as in the further application of such novel processes, the actual use of zinc dust in the hands of various metallurgists and under a variety of conditions has gradually altered the original practice. Step by step some of the negative precautions have been disregarded with apparent impunity, while at the same time the original positive instructions have been altered with consequent improvement. Thus, both by accident and design, fallacies have been exposed and our practical knowledge increased. It will be recalled that one of the points strongly emphasised in the early literature on zinc-dust precipitation was the necessity of preventing oxidation of the dust prior to its mixture with the gold solution. The idea was strongly held that efficient precipitation would occur only when the dust particles were fresh and uncontaminated by oxidation products. In fact, small tube mills were used to brighten the zinc just before using, and successive charges of dust were constantly undergoing this treatment in order that fresh material might be available for precipitation.

This feature was embodied in patents granted to one metallurgist, who proposed to use a tube mill or other grinding apparatus in the precipitation circuit so that the mixture of dust and solution should pass through it. This procedure was adopted because such precipitants as zinc dust "are rendered less efficient and active by reason of the presence of a deterrent coating upon the surfaces of the particles thereof, caused in part at least by their well-known property of oxidation." The mechanical removal of the coating of oxide by abrasion was regarded as essential to efficient precipitation, because otherwise it must be removed by solution before good contact could be obtained. It has come about, however, in at least one instance, that the protection of zinc dust against oxidation by exposure to air is wholly disregarded. At the Homestake slime plant, where zinc-dust precipitation was first installed on a large scale, the dust is exposed to air in shallow pans for periods ranging from several days to a week or more. No provision is made for subsequently grinding the dust to remove any coating of oxide that may have formed, and it is fed dry to the gold solution and pumped to the press. Nor have any ill effects followed this disregard of a generally accepted precaution, all of which suggests the probable fallacy of the original idea.

Production of the Diamond in Electric Furnaces.

Should the results obtained by a metallurgist of Paris, E. de Boismenu, prove to be all that is claimed for them, his method is likely to work a revolution in the production of the diamond. The inventor has just published the results of his work in a brochure which appeared at Paris. The inventor has made a collection of the minute diamond crystals which he obtained, the largest of these having 2.7 mm. (7/64 in.) length. This is believed not to be by any means the possible limit of size, and the inventor is confident of obtaining large crystals of the diamond in a more extensive plant adapted for the purpose. A comparison with Professor Moissan's process is at once suggested, and this is in favour of the new method. It will be remembered that Moissan based his process on the idea of using an extremely high pressure in order to crystallise carbon. Melting iron with an excess of carbon in the electric furnace, he plunges the mass into water so that the surface cools and solidifies around a still liquid inner portion. The violent contraction and resulting pressure on the inside part which is thus obtained acts to bring about a crystallisation of carbon in the shape of microscopic diamonds. The largest size Moissan could obtain was a 0.7 mm. (1/32 in.), and there seemed to be no great hope of increasing this size, so that the method now has purely a scientific interest. Quite the contrary is true in the process used by M. de Boismenu. Pressure does not intervene here, and the method consists simply in electrolysing a fused bath of calcium carbide in an electrolytic furnace by the use of direct current. The heat should last for several hours, and at the end of this time there is found decomposition of the carbide with formation of small crystals of pure carbon. As the size of the crystal depends on the length of the operation, the limit of size cannot be conjectured. It took the inventor a twelve hours' run to obtain his largest size of 2.7 mm., and his experimental plant prevented him from going further, for otherwise he had reason to believe that the size would continue increasing, to what point it is yet unknown.

New Kleinfontein.

The following cablegram has been despatched to the London office of the New Kleinfontein Company:—"In view of the continuation and spread of the strike, the board of directors has decided to postpone the declaration of an interim dividend to the shareholders until normal working conditions again prevail."

Tenders Accepted.

The South African Railways have accepted the following tenders during May, 1913:—(1) White Mealie Meal: Mr. J. Strang, Durban, 3,000 muids at 16s. 5d. f.o.r. Durban; Frenkel & Co., Johannesburg, 3,200 muids at 18s. 9d. f.o.r. Newtown; Natal Mill and Elevator Company, 1,000 muids at 15s. 6d. f.o.r. Umbilo; Mr. F. S. Rank, Germiston, 500 muids at 16s. 9d. f.o.r. Germiston; Vereeniging Milling Company, 500 muids at 16s. 6d. f.o.r. Vereeniging; Gerstle and Hochstadter, 500 muids at 16s. 9d. f.o.r. Germiston. (3) Coaling Plants—Cato Ridge and Hatting Spruit: Cato Ridge, Messrs. Gilbert Hamer and Co., to value of £3,838 (approx.); Hatting Spruit, Messrs. J. & R. Niven, to value of £2,906 (approx).

AMUSEMENTS.

NEXT WEEK'S PROGRAMME

His Majesty's: Holloway Company	8.15
Standard: Quinlan Opera Company	See bills.
Empire	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9

First Class Mining Positions

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics. — E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, Corner Eloff and Pritchard Streets. Box 2061.

RHODESIA'S MINERAL OUTPUT FOR MAY.

Increased Gold Output— Detailed Statistics.

The following is the official return, as supplied by the Rhodesia Chamber of Mines (Incorporated) of the mineral output for the month of May, 1913:—

MATABELELAND.

Bulawayo District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bulawayo District—				
Abercorn 1 (W. J. Lane)	2	120	78.36	329
Agincourt (H. L. Maidwell)	5	463	446.81	1877
Alexandra (J. Stewart)	2	50	15.92	67
Alice and Atlas (Est. R. Barkley dec'd) .	10	684	84.46	355
Do. (tailings)	—	720	31.19	131
Anchor (M. Morrison)	5	112	42.75	180
Anterior Tailings (W. J. Lane)	—	160	16.56	70
Bangali (Hicks and Arbery)	5	98	22.65	95
Belmont (A. D. Hall)	5	201	83.63	351
Do. (tailings)	—	200	14.23	60
Big Ben (W. E. Hunt)	4	262	159.24	669
Do. (tailings)	—	154	92.50	388
Blanket (Forbes Rhod. Synd., Ltd.)	15	850	169.61	712
Bobs (Bobs Reef Syndicate)	5	240	36.85	155
Do. (tailings)	—	200	5.77	24
Bushtick Mines, Ltd.	24 3T	6106	238.19	1000
Do. (tailings)	—	3380	722.43	3034
Do. (slimes)	—	3009	341.96	1436
"C" (D. & C. Synd.)	10 1C	1939	126.84	533
Do. (tailings)	—	1599	185.11	777
Do. (slimes)	–	340	110.71	465
Champion 1 S E & H (R. Aserman)	5	640	198.00	832
Do. (tailings)	—	289	72.91	306
Claremont Mines (Rhod.), Ltd. .. .	20	2126	111.56	469
Clean Up (New Belingwe G.M. Syn.)	5	320	142.51	599
Cottage (Cranleigh Synd.)	2	100	21.56	91
Do. (tailings)	—	125	11.39	48
Cross (T. W. Angus) clean up	—	—	15.53	65
Dam (W. H. Robinson)	2	120	35.13	148
Dame Sceptre & Olga (T. J. Montrose)	2	68	76.93	323
Eagle A (Macdonald & Co.)	5	598	241.92	1016
Do. (tailings)	—	288	42.16	177
Esmee (F. D. Roscoe)	(2 I1)	210	82.33	346
Ettie (R. Smith)	1 D	-	.30	1
Farvic (H. S. Henderson)	5	280	153.02	643
Do. (tailings)	—	314	39.57	166
Fred (Transvaal and Rhod. Est. Ltd.)	5	650	457.12	1920
Glen A (A. Fraser)	3	250	47.60	201
Godwin (Barrett & Stacey)	5	450	108.43	455
Helene (A. Nurnberg)	(5)	105	23.95	101
Imani (E. Rochfort)	2	276	57.63	242
Ivor (S. C. Reynolds) Pannings ...	—	—	3.46	15
I X L (Forbes Rhodesia Syndicate) Tailings	—	550	36.19	152
Jumpers (Newton, McCay & Early)	5	220	50.61	213
Kameel (New Rhod. M., Ltd.)	5	700	287.93	1209
Koba (Koba Syndicate)	5	150	28.17	118
Li Hung Chang (G. Leach)	3	121	15.03	63
Lina (W. J. Cooper)	4	150	122.15	513
Do. (tailings)	—	200	19.47	82
Lonely Reef G.M. Co., Ltd.	15 3T	4900	1503.30	6314
Do. (slimes)	—	4900	2633.11	11059
Lone Hand (Armstrong, Furber & Alexander)	5	423	184.69	776
Mamba (J. M. Stone)	5	27	16.78	70
Matabele Queens' Co., Ltd.	10	1640	361.72	1519
Do. (tailings)	—	1640	542.64	2279
Do. (slimes)	—	704	63.36	266
Matabele 3 (R. M. Nairn)	10	1397	427.74	1796
Do. (tailings)	—	945	78.50	330
Mauretania (J. G. Habbakuk)	2D	6	4.54	19
Minnie's Luck A (Mrs. C. M. Reid)	5	281	51.04	214
Mystery A1N (W. Soutter) clean up	—	–	5.92	25
Nelly (F. D. Roscoe)	2H	584	402.31	1690
New Clifton G.M. & Dev. Co., Ltd., slimes	—	200	10.30	43
New Eclipse (J. R. Stewart)	5	830	199.96	840
Do. (tailings)	—	270	32.27	135
Nita (J. Gardner)	5	570	43.97	185
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	1901	827.57	3476
Do. (tailings)	—	1146	196.72	826
Penzance (R. Urquhart)	2	45	6.77	28
Do. (tailings)	—	50	15.56	65
Princess (C. A. Abbott)	2	144	35.25	148
Red Rose (C. G. Bancroft)	3	90	44.96	189
Riversdale (Bruhns & Schwarz)	5	510	113.23	475
Do. (tailings)	—	500	23.04	97
Riverside (R. Martindale)	2	150	36.39	153
Do. (tailings)	—	240	60.97	256
Roan (J. Robinson)	2	180	31.49	132
Surrey (C. H. Reading) ...	(2)	18	6.38	27
Susanna Mines, Ltd.	8	1004	392.47	1648
Do. (tailings)	—	557	39.81	167
Teutonic (Hanover G.M. Syn., Ltd.	5	723	237.41	997
Tuff Nut (King's Synd.)	5	560	263.32	1106
Do. (tailings)	—	360	45.02	189
Umvoti (Henderson & Toshack)	2	200	39.72	167
Up-to-date (Cumings & Berry) .	3	356	67.43	283
Do. (tailings)	—	274	63.11	265
Wainui (G. D. Otterson)	5	22	47.91	201
Wanderer's Rest (Wheeler, Rintoul, and Davis)	5	406	228.20	958
Worthless (Forward (R.) G.M. Co., Limited)	3	139	23.69	99
Xmas (M. Westerberg)	2	40	10.59	44
Bulawayo District total ...			14.947.69	62,778
Gwelo District—				
Ardpatrick (C. Malcham)	3	374	119.55	502
Do. (other sources)	—	—	3.71	16
Arizona No. 2 S (L. R. Evans) tailings	—	260	38.24	161
Beacon Hill 1 (R. Aserman)	2	158	171.23	719
Bowie 1 (A. Malcolm)	5	200	34.44	145
Broad Arrow (F. Ewing)	10	380	63.11	265
Do. (tailings)	—	250	9.08	38
Bute (T. Pedlow)	5	30	8.79	37
Churchill (J. Jones)	6	30	27.08	114
Cinderella (P. Burt)	1E	365	23.90	100
Csardas (Wolfshall Synd.) ..	10	517	466.35	1959
Do. (tailings)	—	390	79.05	332
Do. (slimes)	—	127	18.15	76
Delegates (O. Hardy) . .	2	30	12.16	51
Gaika G.M. Co., Ltd. ...	5 1C	2810	1124.46	4723
Do. (tailings)	—	1379	66.90	281
Do. (slimes)	—	1000	58.23	245
Gartley (A. J. Grant)	2	58	75.29	316
Glenrosa No. 1 (H. G. McIntosh)	2	187	93.76	394
Do. (tailings)	—	117	20.56	86
Globe & Phœnix G.M. Co., Ltd. ...	40 10P	6420	7751.28	32555
Do. (concentrates)	—	312	745.57	3131
Do. (tailings)	—	3979	998.94	4196
Do. (slimes)	—	1860	615.71	2586
Gretna Green (M. L. Price) ...	5	57	48.78	205
Guinea Fowl and Early Bird (W. Cock)	1H	150	2.96	12
Invulnerable (A. E. West)	5	172	42.11	177
Kings (P. S. Warden) tailings ..	—	410	110.44	464
Moss (James & Morrisby) ...	2	287	193.92	814
New Dunraven G.M., Ltd. .. .	5	713	132.41	556
Do. (tailings)	—	650	56.81	239
New Moss (Robinson & Bennett) ..	2	112	73.91	310
North Bonsor (Cornish Syndicate) ..	15	1880	613.03	2575
Do. (tailings)	—	1260	162.36	682
Pompei (Pharos Syndicate)	2	161	65.45	275
Do. (tailings)	–	100	8.18	34
Pretty Polly (New Rhod. R. Co., Ltd.)	5	172	25.03	105
Do. (tailings)	—	350	21.26	89
Red Hill Dev. Syn., Ltd.	1C	1109	85.08	357
Do. (tailings)	—	320	48.26	203
Sceptre (R. & W. Syndicate) . .	1C	405	69.64	292
Do. (tailings)	—	270	21.48	90
Selukwe Columbia G.M., Ltd. . . .	1C 3P	3310	1276.87	5363
Do. (concentrates)	—	130	115.53	485
Do. (tailings)	—	2092	363.42	1526
Do. (slimes)	—	950	122.75	516
Do. (other sources)	—	—	129.98	546
Shamrock (Crampin & Masters) ...	10	942	102.75	432
South Bonsor (Ideal Synd.)	10	652	57.23	240
Stator (C. C. Stack)	2	40	35.58	149
Tebekwe (A. N. Tyrrell)	15	673	69.52	292
Veracity (slimes) (J. Fischer)	—	455	36.63	154
Wanderer (Selukwe) G.M., Ltd. ...	4GR	18042	1982.60	8327
Gwelo District Total			18,699.51	78.537

Matabeleland Total ... ... 33,647.20 ozs.

Value £141,315

MASHONALAND.

Hartley District—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Acorn Gold Mines, Ltd.	5	467	94.02	395
Agnes (P. S. Triggs)	5	441	134.54	565
Amaroso (C. H. Wheildon)	5	419	82.91	348
Do. (tailings)	—	323	40.39	170

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Battlefields (Rhodesia), Ltd. (Minaar & McArthur)	2C	1365	398.28	1673
Do. (tailings)	—	1022	179.98	756
Do. (slimes)	—	273		
Blue Rock (Blue Rock Synd.)	2	300	35.30	148
Do. (tailings)	—	250	28.72	121
Boss (Fiander Bros.)	2	50	20.62	87
Brilliant (Mabel's Luck Synd.)	7	720	375.41	1577
Do. (tailings)	—	352	123.28	518
Butterfly (F. W. G. Richards) tailings	—	1200	17.51	74
Cheshire Cat (Tavener & Arnold)	5 1P	448	240.96	1012
Do. (tailings)	—	300	91.06	382
Do. (slimes)	—	148		
Concession and W. Extension (C. E. Simpson)	5 1C 2P	2263	415.62	1746
Do. (tailings)	—	1770	113.88	478
Crown No. 2 (Crown Synd.)	2	150	21.39	90
Do. (tailings)	—	120	21.78	91
Dalny (Phillip Wiggins, Ltd.)	5	240	34.25	144
Dalny 1W. (Shagari Mines, Ltd.)	5	360	62.36	262
Do. (tailings)	—	345	67.18	282
Dowry (P. A. Enke)	1 PN	300	30.54	128
Dreadnought (W. E. Masters)	1 C	350	38.12	160
Duke No. 1 (Jose & Munro)	5	160	50.91	214
Eiffel Blue & E. Ext. (Willoughbys)	10	1345	555.03	2331
Do. (tailings)	—	870	84.56	355
Giant Mines of Rhodesia, Ltd.	30 2T	12000	3156.77	13390
Glasgow Mines, Ltd.	5	470	163.50	687
Do. (tailings)	—	300	56.07	235
Glencairn No. 3 (Glenrosa Synd.)	4	400	277.31	1165
Do. (tailings)	—	276	20.69	87
Glynn Valley (J. Mack)	10	841	142.85	600
Do. (tailings)	—	490	58.69	246
Guelph (Mr. and Mrs. Davidson)	(5)	105	54.61	229
Harvey's Chance (J. Conley)	(5)	64	13.61	57
Iberia 1 (Hartley Pioneer Synd.)	1 H	245	38.91	163
Juno (H. R. Nicholl)	5	470	81.18	341
Do. (tailings)	—	180		
Kanyemba (Kanyemba Synd.)	5	460	478.31	2009
Do. (tailings)	—	268	55.61	233
Luke (Luke Syndicate)	5	180	33.11	139
Nada (G. H. Fison)	1 PN	36	20.90	88
New Milky Way No. 3 (J. Mack)	5	350	54.47	229
New Union Jack (S.A. Beach) tailgs	—	120	19.50	82
Oleander G.M. Co., Ltd.	3	311	125.29	568
Do. (slimes)	—	175	61.99	260
Do. (tailings)	—	136		
Owl (A. Rolfe)	10	1386	457.38	1921
Do. (tailings)	—	937	115.64	486
Pickstone Gold Mines, Limited	10	1268	581.06	2440
Do. (tailings)	—	620	105.23	442
Pomposo (J. Knott)	5	306	141.34	594
Rosherville (J. Tilbury)	1 H	105	53.58	225
Rouge (Durrell and Morkel)	5	1108	137.30	577
Do. (tailings)	—	578	84.47	354
Seigneury (Cen. Min. & In. Cor., Ltd.)	5	400	117.85	495
Do. (tailings)		290	28.22	118
Shepherds (Phoenician (Rhod.) Co., Ltd.)	5	584	158.75	667
Do. (tailings)	—	357	96.55	405
Sid (Sebakwe & District Mines, Ltd.)	5	705	244.51	1027
Do. (tailings)	—	870	77.89	327
St. Oliven No. 4 (Yellow Jack Synd.)	2	120	69.44	292
Tea (Cen. Min. & In. Corp., Ltd.)	5	896	211.27	887
Do. (tailings)	—	380	24.24	102
Thistle-Etna G.M., Ltd.	1 C	3500	918.76	3859
Do. (tailings)	—	2825	202.33	850
Do. (slimes)	—	576	37.94	159
Try Me 2 (R. R. Aitkin)	5	500	285.98	1201
Washington (I. J. Minaar)	5	420	312.60	1313
Do. (tailings)	—	360	54.51	229
Do. (slimes)	—	300	10.86	46
White Rose (J. Mack)	5	437	141.95	596
Do. (tailings)	—	192	25.83	108
Hartley District Total			12,977.45	54,635
LOMAGUNDI DISTRICT.—				
Eldorado Banket G.M. Co., Ltd.	20 2C 8P	7633	3405.15	14441
Do. (tailings)	—	7429	820.74	3481
Other Sources	—	—	108.50	448
Linnett (A. R. Morkel)	2	443	208.89	877
Mint (J. A. Morris) Pannings	—	—	18.01	76
Ventura (Stone & Standen)	2	271	108.18	454
Lomagundi District Total			4,669.47	19,777
MAZOE DISTRICT.—				
Authentic (Mrs. Adamson) tailings	—	300	15.17	64
Commonwealth G.M. Co., Ltd.	(30)	200	22.70	96
Do. (tailings)	—	120	11.50	49
Do. (slimes)	—	80	5.80	25
Goth (Goth Synd.)	2	126	66.87	281
Honest (G. Brown)	3	102	33.63	141
Jumbo G.M. Co., Ltd.	30	3060	553.40	2352
Do. (tailings)	—	1820	280.08	1190
Do. (slimes)	—	1240	141.09	600
Mitre 8 (Bishop's Synd.)	1 D	18	18.80	79
New Found 1 N. (D. H. Curry)	5	408	230.05	966
Puff Adder (Puff Adder Synd.)	2	181	137.43	577
Thornhill & Tat (Oceola G.M. Co., (Limited)	5	650	276.49	1161
Do. (tailings)	—	550	38.29	161
Tom Cat (Monarch (Tati) G.M. Synd.	1 Pn	403	61.69	259
Umkulu D.B. 1W (Llahsram Synd.)	2	143	42.62	179
Warwick (A. G. Whyte)	—	—	6.39	27
Mazoe District Total			1,942.00	8,207
SALISBURY DISTRICT.—				
Hopefield (Hopefield Syndicate)	2	240	102.87	432
Do. (tailings)	—	220	81.05	340
Inyague 3 (P. L. Peters)	2	106	53.81	226
Louise Grand (H. S. Plant)	2	845	64.92	273
Do. (tailings)	—	845	88.64	372
Mashona (B. G. Byerley) tailings	—	102	6.86	29
Mont d'Or (Claxton & Russell)	2	108	140.64	591
New Full Back (New Full Back G.M. Synd.)	2	297	50.94	214
Virgin (J. Vorweck)	2	72	33.69	141
Salisbury District Total			623.42	2,618
UMTALI DISTRICT.—				
Arthur (Mrs. M. L. Hoole)	5	59	5.72	24
Elgin (Umtali Waterfall Synd.)	(10)	368	234.01	983
Do. (tailings and slimes)	—	186	53.14	223
		182		
Kent (E. Evans)	5	310	59.97	252
Do. (tailings)	—	190	19.19	81
King's Daughter D.B. (Umtali Waterfall Synd.)	10	372	87.69	368
Do. (tailings)	—	171	15.02	63
Do. (slimes)	—	1050	70.38	296
Liverpool 38 (R. G. Snodgrass)	5	1084	82.34	346
Do. (tailings)	—	120	27.25	115
Mecca (Umtali Waterfall Syn.) t'lings	—	93	14.62	62
Do. (slimes)	—	163	8.97	37
Pilgrim 2 E (J. Meikle)	5	433	216.30	908
Quagga (Quagga Synd.)	5	880	178.87	751
Rezende Mines, Ltd.	95	14936	1734.64	6360
Do. (concentrates)	—	159	543.32	2269
Do. (tailings)	—	2938	308.48	1309
Do. (Other Sources)	—	—	21.16	88
Rezende D B 2 (Imbeza Synd. No. 2 Clean up	—	—	26.20	111
Union (Umtali Waterfall Synd.)	(10)	240	15.56	65
Umtali District Total			3,722.83	14,711
VICTORIA DISTRICT.—				
Texas (J. Scott)	5	850	231.10	971
Do. (tailings)	—	500	52.03	218
Victoria District Total			283.13	1,189

MASHONALAND TOTAL ... 24,218.30 ozs.
VALUE ... £101,137.
GRAND TOTAL GOLD OUTPUT ... 57,865.50 ozs.
VALUE ... £242,452.

SUMMARY.

Gold.	ozs.	Value.
Matabeleland	33,647.20	£141,315
Mashonaland	24,218.30	101,137
Total	57,865.50	£242,452
Silver, ozs.	14,029.51	1,529
Lead, tons	35.50	604
Chrome Iron, tons	3,747.20	8,364
Diamonds, carats	394.00	4,945
Coal, tons	19,685.00	(Sales) 6,257
TOTAL VALUE MAY OUTPUT		£264,151

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THE WEEK IN THE SHAREMARKET.

Strike and Balkan News Cause Weakness—Fluctuations in Zaaiplaats—Many Stocks Remain Firm.

The market this week, of course, has been overshadowed by the strike, and quotations practically all along the line have fallen. The effect has not been confined to Rand stocks but has been reflected in the prices of tin and diamond shares. News from the Balkans has also caused uneasiness, and possibly London has paid more attention to that factor than to the trouble on the Rand. Considering the many evil immediate consequences that may attend the strike, the market has taken it surprisingly well; and the fact that several of the mines, if now closed down, are in danger of never restarting at all, does not seem to be fully realised. In the circumstances, the action of the East Rand and New Kleinfontein directors with regard to dividends has met with general approval. Among tin shares, Zaaiplaats have been again the sensation of the week, exhibiting some big fluctuations in price. Diamonds have dropped a little in sympathy with the general market, but, on the whole, remain firm.

	Friday, 27th.	Sat., 28th.	Mon., 30th.	Tues., 1st.	Wesd., 2nd.	Thur. 3rd.
African Farms ..	15 9B	16 0	15 6B	15 0	14 9	14 0B
Apex Mines ..	—	23 0B	22 6B	21 0B	23 0s	20 0B
Bantjes Cons. ..	20 9B	21 0B	20 3B	19 0B	19 0	18 0
Benoni Cons. ..	3 0B	3 3B	3 0B	2 11B	2 9B	2 8B
Blaauwbosch Dia.	120 0s	—	120 0s	120 0s	120 0s	
Brakpan Mines ..	67 0B	67 0B	66 0B	62 6s	60 6	56 6B
Breyten Collieries ..	—	29 0B	—	25 0B	27 6B	27 6B
British S.A. ..	—	17 0B	—	—	—	—
Bushveld Tins ..	0 7B	0 6B	0 8	0 6B	0 6B	0 6B
Cinderella Cons. ..	8 0B	—	5 0B	—	—	6 0B
City & Subs. (£4) ..	49 0B	49 6	49 0B	41 6B	41 0B	40 0B
City Deep	58 9B	59 0B	57 6B	54 6	52 0B	52 0B
Cloverfield Mines ..	5 0B	5 1B	5 0B	—	4 6	4 6
Clydesdale Colls. ..	8 6B	—	8 6B	—	—	—
Cons. Langlaagtes	26 3B	26 0B	26 3B	25 0B	25 60	25 0B
Cons. Main Reef ..	17 6B	17 6B	17 6B	16 9†	16 3B	15 0B
Cons. Mine Select	—	—	14 0s	—	—	—
Coronation Colls. ..	15 0B	—	—	14 0	14 6s	14 0s
Coronation Freehold	0 4B	0 4B	0 4B	—	0 4B	—
Coronation Synd.	3 0B	—	3 0B	—	—	3 0B
Crown Diamonds ..	13 6	13 9	13 3	11 9	11 3	10 6B
Crown Mines ..	—	143 9*	—	—	—	—
East Rand Centrals	8 6B	8 9B	8 9B	8 6B	—	8 0B
East Rand Coals (2/6)	1 10B	1 9B	1 9B	1 9B	1 9B	1 9B
East Rand Deeps..	2 3B	2 4B	2 4B	2 2	—	—
East Rand Props.	—	—	52 0B	51 0B	50 0B	48 0
East Rand Debs.	£90B	£90B	£92s	£90s	—	—
Eastern Golds (1/)	1 4B	1 4B	1 4B	1 4B	1 4B	1 3B
Frank Smith Diam.	13 6	13 9	13 0	12 3	12 3	11 9
Geduld Props. ..	22 0B	22 0B	21 9B	20 6B	19 6B	19 6B
Geldenhuis Deeps	30 0B	—	—	—	—	—
Glencoe (Natal) Colls.	8 3B	7 9B	7 9B	7 3B	—	8 6s
Glynn's Lydenburgs	18 0s	17 0B	—	—	18 0s	18 0s
Government Areas	22 0B	22 6B	22 3*	21 6	20 9B	20 3
Hex River Expls.	—	0 6B	—	0 6B	0 6B	—
Jumpers	—	5 0s	—	8 0B	—	3 0B
Jupiters	—	—	—	—	7 6B	—
Klerksdorp Props.	2 0B	2 2B	2 2B	—	—	—
Knight Centrals ..	9 6	9 3B	9 0	9 3	9 0s	7 6B
Lace Props. ..	3 1B	3 2B	3 0	3 1	3 0B	2 9B
Luipaardsvlei Est.	7 3B	7 0B	—	—	—	—
Lydenburg Gold Fms	3 3B	3 3B	3 0B	—	—	—
Main Reef West ..	11 0	10 0B	9 6	8 9B	8 6B	8 6B
Main Reef W. Debs.	—	—	£75B	—	—	—
Middlevlei Estates	—	—	—	1 0B	—	0 9B
Modder B's ..	77 0B	78 0B	76 6B	72 0	70 0B	71 0
Modder Deeps ..	32 6B	32 6B	32 6	31 0B	31 3B	31 3
Natal Navigation Col.	15 0B	15 0B	15 9B	—	—	16 0s
New Boksburgs ..	—	0 6B	0 6B	—	—	0 6n
New Elands Diam.	—	—	27 0s	—	—	—
New Era Cons, (5/-)	6 6B	6 9B	6 6B	6 6B	6 3	6 0B
New Geduld Deeps	2 4B	—	2 3B	2 4	1 9B	2 0B
New Kleinfontein..	—	21 6B	21 3B	21 0	—	—
New Modders ..	250 0B	250 0B	—	—	230 0B	215 0B
New Rietfonteins	4 6B	4 6B	4 6B	4 0B	—	—
New Unifieds ..	—	15 9s	—	—	—	—
Nigels	—	19 0B	20 0	—	—	—
O.F.S. & Trans. Dia.	1 9B	1 9B	1 10	—	1 6B	1 6B
Potchefstroom Est.	—	—	—	—	0 9B	—
Premiers Def. (2/6)	—	—	240 0B	—	—	—
Pretoria Cement Co.	52 6B	53 6	54 0s	47 6B	49 0s	—
Princess	6 3B	6 0B	6 0B	6 3s	—	—
Rand Collieries ..	4 6s	3 0B	—	—	—	—
Rand Klips ..	1 6B	1 6	1 3B	1 3B	1 2B	1 0B
Rand Nucleus ..	2 2B	2 6s	2 0B	2 3	2 0B	2 1
Randfontein Deeps	3 9s	3 6B	3 6B	—	—	3 0B
Randfontein Est. ..	27 0B	27 9	26 9B	25 0	24 9	24 0B
Rietkuils	—	1 0s	—	—	—	—
Roberts Victors .	32 6B	32 6B	31 3B	31 0B	30 0B	—
Rooiberg Minerals.	36 0B	36 6	36 0B	30 0	29 9B	28 0
Ryan Nigels ..	3 6B	3 6B	3 6B	3 6B	3 6B	3 6B
Shebas	5 0B	4 10B	4 10B	4 6B	—	5 0s
Simmer Deeps ..	—	—	—	—	2 0B	2 0B
Solomon's Temple Tin	—	0 8B	—	—	—	0 6B
S.A. Breweries ..	38 0B	38 0B	38 0B	38 0B	38 0B	37 0B
S.A. Lands ..	3 6	3 5	3 3B	3 3B	3 3B	3 0B
S.A. Tin Mines ..	0 6B	—		—	—	—
Springs Mines ..	16 6B	17 0B	16 6B	15 6	15 3	15 3
Sub Nigels ..	12 6B	12 3B	12 0B	12 0s	10 9B	9 6
Swaziland Tins ..	—	49 0B	44 0B	—	—	48 0s
Trans. Coal Trusts..	42 0	42 3	40 6B	38 6	—	32 0B
Trans. G.M. Ests.	52 9B	52 9B	52 6B	—	—	—
Tudors	—	—	—	1 9s	—	—
Van Ryn Deeps ..	31 3B	31 9	30 9	29 9	29 6	28 3
Village Deeps ..	43 6s	42 6B	42 0	40 0	—	39 0B
West Rand Estates	3 6B	—	3 6B	—	—	—
Witbank Collieries	—	44 0B	44 0B	—	—	—
Witwatersrands ..	73 0B	—	72 6B	65 0B	65 0B	61 0B
Wit. Deeps ..	60 0	60 0	58 6	56 0	53 6	53 6
Wolhuters	13 9B	13 9B	13 6B	13 0B	13 6s	12 0B
Zaaiplaats Tins ..	42 0B	42 0	41 6	37 0B	36 0	31 0

B Buyers. S Sellers. * 50 Shares. † 66 Shares.

Glynn's Lydenburg.

The profits earned by Glynn's Lydenburg in the quarter ended April 30th amounted to £8,851. The number of feet driven, sunk and risen, exclusive of stopes, was 1,700 feet. The reef disclosures were as follows: Distance exposed, 60 feet; width, 10 in.; assay value, 39s. 4.248d. *Reduction Works.*—Ore received from mine, 9,717 tons; tonnage crushed, 9,720 tons; number of stamps operating, 20; number of tube mills operating, 1; value of ore before crushing (calculated at 84s. per fine oz.), mill yield per ton, 11s. 7.5d.; assay value of pulp, 31s. 5.8d.; total, 43s. 1.3d. Total yield, 4,724.006 fine ozs.; total yield per ton, 9.720 dwts. The manager reports as follows:—The tonnage crushed for the quarter was 9,720 tons, as compared with 9,847 tons in the preceding quarter. The total yield for the same periods was 4,724.006 fine ozs. and 5,062.356 fine ozs. respectively. This reduction in the output was owing to the ore milled being of slightly lower grade, but I believe this will prove to be only temporary. The costs for the quarter were 21s. 0.4d. per ton, as compared with 20s. 2.2d. per ton in the preceding quarter. The high costs are due entirely to the small tonnage milled owing to insufficient labour, a breakdown at the Power Station in February, and of the tube mill in April, which caused it to be closed down during the greater part of the month. There does not appear to be any reason why we should not have a clear run during the quarter ending 31st July, 1913, and obtain a normal profit. Native labour has not been so plentiful during the past three months, and shows a decrease of 19 in the average number of boys employed as compared with last quarter. What satisfied our requirements in the shape of native labour a few years ago will by no means do so now. As we go farther the reefs become, for the most part, narrower, and in harder ground. It therefore takes more boys to get out a ton of ore than formerly. More especially is this so in the places where the ore is of good grade. We are now starting to attack the Werf Mynpacht on its eastern boundary, at points about 360 and 860 feet ahead of our present workings, and within the next two or three months we hope to be opening it up all along the eastern boundary from our present workings southwards. The 150 claims held to the south of the Werf Mynpacht are also being prospected by shafts, and it is hoped to cut the horizon of the reef shortly.

INVESTORS' DIARY.

The following company meetings have been announced:—

July 30.—Booysens Estate.
July 30.—Middlevlei Estate.
July 31.—Glynn's Lydenburg (Special).
Aug. 5.—City Deep.
Aug. 26.—Glynn's Lydenburg (Special).
Aug. 26.—Transvaal Gold Mining Estates (special).
Sept. 19.—Transvaal Gold Mining Estates (special).
Sept. 26.—Simmer and Jack Prop.
Sept. 26.—Sub-Nigel.

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Engineering Notes and News.

International Engineering Congress.

In connection with the Panama-Pacific International Exposition to be held in San Francisco in 1915, there will be an International Engineering Congress, in which engineers throughout the world are invited to participate. The Congress is to be conducted under the auspices of the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, and the Society of Naval Architects and Marine Engineers. These societies, acting in co-operation, have appointed a permanent Committee of Management, consisting of the Presidents and Secretaries of each of these Societies, and eighteen members resident in San Francisco. The Committee has effected a permanent organisation, with Prof. Wm. F. Durand as Chairman, and Mr. W. A. Cattell as Secretary-Treasurer, and has established executive offices in the Foxcroft Building, 68, Post Street, San Francisco. The Papers presented at the Congress will naturally be divided into groups or sections, each of which will hold independent sessions, presided over by a chairman eminent in the branches of engineering covered by his section. The scope of the Congress has not as yet been definitely determined, but it is hoped to make it widely representative of the best engineering practice throughout the world, and it is intended that the Papers, discussions and proceedings shall constitute an adequate review of the progress made during the past decade and an authoritative presentation of the latest developments and most approved practices in the various branches of engineering work. The Papers will be collected and published in such form and as such cost as to become available to the greatest possible number.

* * * *

International Mining Congress, 1915.

The International Congress of Mining, Metallurgy, Applied Mechanics and Practical Geology is to be held in London in 1915. Several preliminary meetings of the Organisation Committee have already been held, and a decision arrived at that the sections of the Congress be divided into four groups as follows:—Group 1, mining; section A, coal mining; section B, metal mining; Group 2, metallurgy; section C, ferrous metals; section D, non-ferrous metals; Group 3, applied mechanics; section E, mechanical engineering; section F, chemical engineering; section G, electrical engineering; Group 4, geology. The presidents of the Associated Institutions in office at the time of holding the Congress are to be invited to act as chairmen of the sections, as follows:—Coal mining, President, Institution of Mining Engineers; metal mining, President, Institution of Mining and Metallurgy; ferrous metals, President, Iron and Steel Institute; non-ferrous metals, President, Institute of Metals; mechanical engineering, President, Institution of Mechanical Engineers; chemical engineering, President, Society of Chemical Industry; electrical engineering, President, Institution of Electrical Engineers; geology, President, Geological Society.

* * * *

An Iron Trade Sensation.

A profound sensation was caused throughout the iron trade in mail week, when the announcement was officially made on the Glasgow pig-iron warrant market that Messrs. James Watson & Company had been obliged to suspend payment. This firm is one of the most prominent in that market, and is well-known throughout the world. It was associated with the recent corner in the pig-iron warrant market, and the failure is, of course, directly traceable to the sharp fall in Cleveland warrants since the squeeze ended, the price having dropped from about 71s. per ton to 54s. 5d. per ton, or 16s. 7d. per ton altogether. Messrs. James Watson & Company are a very old firm, having commenced business in 1864, and are held in high esteem by the trade generally. In addition to their operations in the warrant market, Messrs. Watson carried on an extensive business as merchants in various kinds of pig-iron.

* * * *

The Port Elizabeth Agricultural Society's Motor Ploughing Competition.

The official report of this important event, which we believe was the first motor tractor competition in South Africa, has been published in the following terms:—Before recording our awards in connection with the above trials, we consider it advisable to refer briefly to the procedure adopted at the trials. The trials were held at Perseverance on Wednesday, March 26, and following days, on land lying to the east of the Port Elizabeth-Uitenhage Railway, measuring 575 by 205 yards, which was divided into suitable sized plots. Lots were drawn by the competitors to ascertain their respective sections. On March 26 we inspected the various plants, and gave the competitors an opportunity of pointing out their salient features. On March 27 the plants proceeded in rotation to plough their allotted plots with mould board ploughs. A record of the acreage and time occupied, the fuel and water consumed, and the depth ploughed was taken. A standard depth of 8in. was decided upon, but owing to the variety of ploughs used, some of which were unable to allow that depth, the records of fuel consumption and time were not readily comparable. That afternoon the same tractors were attached to disc ploughs. The judging of the ploughs was undertaken by Messrs. N. W. Chandler, W. Rubidge, O. E. G. Evans, and G. White. On March 28 ploughing with disc ploughs was continued, and on its completion all tractors proceeded with a cross-ploughing test over the same area, some drawing disc and others mould board ploughs. An opportunity of showing the turning radius of their respective plants was also given to all competitors. On March 29, at our request, a further trial of certain selected plants was held on land to the west of the railway, each tractor drawing the same plough in turn, which was set at a specified depth. *British Competitors.*—The following tractors competed in the trials:—24 b.h.p. "Ivel" Agricultural Motor, Mangold Bros., Port Elizabeth, £450, less 5 per cent. for cash; 30/60 b.h.p. Rumely "Oil Pull," Type "E," Malcomess and Co., Ltd., East London, £925; 18/20 b.h.p. "Universal" Tractor, S. Sykes and Co., Johannesburg, £375; 50 b.h.p. McLaren's "Royal" Steam Tractor, J. and H. McLaren, Leeds, England, £690; 15/25 b.h.p. Fairbanks Morse Oil Tractor, Duffet and Koch, Capetown, £568; 30/40 b.h.p. Ransomes' Special Agricultural Steam Tractor, Mangold Bros., Port Elizabeth, £725, less 5 per cent. for cash; 30/50/60 b.h.p. Big Four "30" Agricultural Oil Motor Tractor, self-steering, Emerson-Brantingham Implement Company (Inc.), Rockford, Illinois, U.S.A.: Special South African representative, Mr. H. D. Dodge, P.O. Box 81, Port Elizabeth, £950; 25 b.h.p. "Mogul" Tractor, Wm. Spilhaus and Co., Capetown, £550. Early in the trials we realised that we were confronted with a difficult problem in judging the merits of the respective tractors, on account of the variation in power. Owing, however, to the liberality of the Society in placing at our disposal an additional sum of 25 guineas for a special prize, we decided to award this to the most suitable general purpose tractor for use on farms. *Steam v. Oil.*—The comparison between the respective merits of steam and oil tractors must always be a difficult one in this country owing to the proximity or otherwise of the sources of supply of fuel and water. Furthermore, in consequence of the necessary limitations of time and area, which made it impossible to obtain as much scientific data as would be desirable to give an accurate comparison of the economy and comparative merits under the varying conditions prevailing in the Midlands, we realised that only time can prove whether internal combustion or steam engines are best suited to individual requirements. *First Prize for British Firm.*—The storage of oil in bulk as opposed to the present system of supply in small cases, and a fall in the price of liquid fuel, might materially alter the respective merits at an early date. Taking the tractors as shown, we have unanimously decided to award the prize of £100 to J. and H. McLaren, Leeds, England, for their 50 b.h.p. "Royal" steam tractor, priced at £690, and a special prize of 25 guineas to Messrs. Sykes and Co., Ltd., Johannesburg, for their 18-20 b.h.p. "Universal" tractor, priced at £375. The following information with reference to the winning tractors may be of interest:—McLaren: Total area ploughed, 2 acres; time per acre, 28 minutes; fuel consumed per acre, 80 lbs. Natal coal; water evaporated per acre, $51\frac{1}{2}$ gals.; average depth of ploughing, $8\frac{1}{2}$ inches; radius of turning circle, 16ft. 5in.; number of bottoms to plough, 8. Sykes: Total area ploughed, $\frac{1}{2}$ acre; time per acre, 1 hr. 23 min.; fuel consumed per acre, petrol 2 pints, paraffin $3\frac{5}{8}$ gals.; water evaporated per acre, not measured; average depth of ploughing, 7 inches; radius of turning circle, 12 feet; number of bottoms to plough, 2. In making the above awards, we would call attention to the outstanding features of (1) the prize-winning tractors, (2) those which we consider merit special notice.

* * * *

Konomax Drill Tests.

The Konomax Drill Company made a small loss last year. Licences have been granted to manufacturers here and elswhere, and therefore the expenses of running the syndicate should never be very great. Last year's test at the Village Deep proved so satisfactory that the Rand Mines decided to equip one of their mines completely with the larger size drill, with the object of a six months' test, the Bantjes being selected, and the run has just been completed. The weight of the drill has been reduced, and the present design may be considered standard, and should not require any but minor changes. The Rand Mines consented to make a thorough test of the $2\frac{1}{2}$ inch drill: the air used was found to be 34 per cent. less than with the big drill, and the tonnage broken per machine shift was greater. It has been decided by the Bantjes to equip throughout with Konomax drills. It has been calculated, on the assumption that the efficiency of drills now working can be brought within 10 per cent. of the original, that a saving of £200,000 a year could be effected on the Rand were the Rand equipped with Konomax drills. A special drill has been evolved for coal cutting purposes. Introduction of the ordinary types into other markets is deferred until it has been introduced to a greater extent here.

Tungsten is used chiefly in making steels that will hold their temper when heated, but it is most generally known as supplying the filament of tungsten incandescent lamps. The great improvements in drawing tungsten wire, and further notable improvements in the size of the globe of the tungsten lamp, and in other mechanical details that add greatly to its efficiency, are making it encroach upon the carbon-filament lamp and the arc lamp, and it is rapidly driving from the market the tantalum lamp, which was the first good incandescent lamp having a metallic filament. Diamonds are used for dies in drawing tungsten wire. At first it did not seem possible to drill small enough holes through the diamonds to make wire sufficiently fine for lamps of small candle-power, but wire 0.0006in. diameter can now be drawn in quantity. The total quantity of tungsten ore used for electric lights, however, amounts to only a few tons per year. New uses of tungsten, in making electric furnaces, electric contacts, and targets for Rontgen rays, have been developed, and tbo last two products are being actively manufactured.

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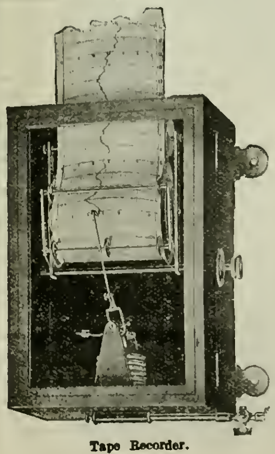

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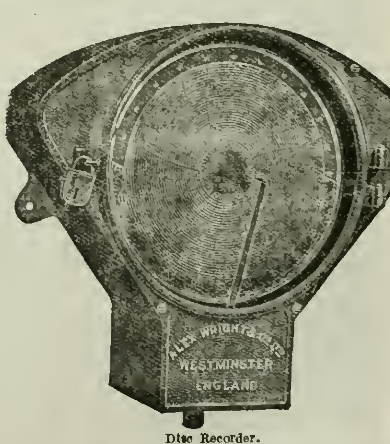

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Finance, Commerce, and Industries.

Cape Industries.

The Public Works Committee of the Woodstock Council reported at a meeting of that body held last month, that they had considered an application from Mr. G. Bothwell for permission to commence a crayfish canning business at premises at the corner of Albert and Spencer Roads, Salt River. The Sanitary Superintendent reported on the application, and the committee, having in mind an application made by Mr. A. D. Wilson in July, 1912, for permission to establish a similar factory on ground in Spencer Road, belonging to the South African Milling Company, in conjunction with the tinsmiths' business carried on in Mr. Bothwell's property, when the Council decided not to sanction the application on account of the close proximity of the premises to Albert Road and other dwellings, it recommended the Council to decline to authorise the establishment of a crayfish canning business in Mr. Bothwell's property. The report was adopted.

* * * *

Rhodesia Railways.

The annual meeting of the Rhodesia Railways, Ltd., was held in mail week. Mr. Rochfort Maguire, who presided, moved the adoption of the report. He said that their gross revenue had reached just over £1,000,000, a slight increase over the previous year, but working expenses were higher, at £418,372, with the result that their net earnings had fallen by £35,734, or £582,458. That represented a decrease of nearly 6 per cent., but as it was the result of causes that were perhaps largely abnormal and temporary, it did not seriously detract from the excellent results of the year's working. The number of passengers had risen from 312,000 to 344,000, the tonnage of goods from 225,000 to 250,000 tons. Revenue from passenger traffic had increased by £8,000, and from minerals by over £16,000, but there had been a decline of nearly £24,000 in general goods in spite of the increased tonnage. In 1910-11 the working expenditure had been £380,438, or 38·1 per cent. of the gross revenue, and in 1911-12 £418,372, or 41·8 per cent. The increase was chiefly due to the larger volume of business. Their profit for the year amounted to £212,773, as against £240,491 for the previous year. The gross revenue for the six months ended March 31 was £530,309 as compared with £504,797 for the same six months in the previous year; expenditure was £226,046 as against £202,016, and the net revenue £304,263 as against £302,781.

* * * *

Differential Freight Rates.

The Dominions Royal Commission is considering the important question of the advantage in freight rates which foreign traders enjoy, in shipping to Empire markets, over exporters in the United Kingdom. The Commission is evidently fully alive to the seriousness of the position. The evidence forthcoming on the subject, in the Dominions especially, has been startling, and has prompted the Commission to endeavour to obtain further evidence. There are so few bodies in a position to testify that the subject cannot be fully investigated through them alone. An enquiry by the Board of Trade should be instituted at once, with the assistance of the Consular Service and Trade Commissioners, so that a full view of the difference in rates may be available for the Commission. Meantime, the Manchester Chamber of Commerce has prepared a statement which is a model for the Board of Trade to follow. From the information this document contains there can be no doubt that the question is an urgent concern for the industries of the Manchester district. It shows, among other things, that cotton goods can be shipped from the Continent to the Dutch East Indies for 1s. 8d. to 2s. 4d. a ton less than from Birkenhead; that the Continental rate for galvanised wire netting to Australia is 4s. 7d. less than from England; and that iron wire and barbed wire for Queensland costs from 6s. to 15s. 6d. less per ton for shipment from Antwerp than from British ports. How do the shipowners explain these differences with which British manufacturers are burdened?

Manufacturers as Financiers.

The new principle of linking a financial business to industrial undertakings—on the German principle—has proved a practical success in the case of two notable British companies. The first to embark on this new line of enterprise was Callender's Cable and Construction Co., whose lead has soon been followed by the Metropolitan Carriage, Wagon and Finance Co., Ltd. Mr. Dudley Docker, the chairman of this big concern, stated at the annual meeting that their financial policy had been a powerful factor in increasing their profit during the past year, while enabling large customers to invest in new equipment at a time when, owing to the stringency of the money market and various other causes, it would otherwise have been impossible for them to do so. Mr. Docker has advocated for a number of years this alliance of finance with business, and its practical success under his own management happily turns the tables on the critics who so confidently gibed at his proposals. There is undoubtedly great scope for the extension of this principle in connection with British industry.

Vaal River Diamonds.

The following is the monthly report of the Secretary of the New Vaal River Diamond and Exploration Company, Ltd.:—During April 507 diggers, working on the estate of the New Vaal River Diamond and Exploration Company, Ltd., produced 4,705 carats of diamonds, which realised £38,993 10s.

East Rand Proprietary Mines.

The report on the operations of the East Rand Proprietary Mines, Ltd., for the three months ended 31st March is as follows:—Working revenue, £736,517 19s., equal to 30s. 10d. per ton milled; working expenditure, £467,019 18s. 5d., equal to 19s. 7d. per ton mliled; working profit, £269,498 0s. 7d., equal to 11s. 3d. per ton milled. The profit for the quarter was increased to £280,222 14s. by the addition of £10,724 13s. 5d., being profit derived from the treatment of 18,728 tons of accumulations. From this profit must be deducted approximately £56,010 3s. 5d. to meet the quarterly proportions of the Transvaal Government tax, interest on debentures, etc., the details of which are as follows:—Undermining rights annuity, £3,785; interest on debentures, £17,929; estimated Transvaal Government 10 per cent. profit tax, £21,133; payments on account of French fiscal taxes, £2,718; miners' phthisis compensation fund, £10,445. The expenditure on authorised votes for the quarter was £50,798, as under: Reduction plant, £1,019; pumping and air plants, £2,023; turbo set and boilers, £3,491; native compounds, £552; shaft sinking, excavations, etc., £37,231; sundry surface and underground equipment, £6,480. Approximate cash postiion at 31st March: Approximate financial position, after providing for all liabilities, but exclusive of the debenture issue of £1,435,880, £382,023; less cash assets (stores and materials, sundry debtors, payments in advance, etc.), £134,112; balance—approximate cash position, £247,910. Incline shaft sinking, 96 feet; vertical shaft sinking, 343 feet. Number of feet driven, risen and sunk (excluding shafts), 15,486 feet; footage sampled, 11,367 feet; average reef channel width, 24 inches; average assay value over reef channel width, 10·6 dwts.; number of cubic feet excavated (stations, ore bins, etc.) in addition to above footage, 155,786 cub. ft. Ore mined, including ore mined from development faces, 525,200 tons; ore taken from surface dumps, 2,070 tons; total, 527,270 tons. Current ore treatment:—Milling: Percentage of waste sorted out, 9·6; number of stamps in operation, 820; average running time, 74·2 days; ore milled, 477,700 tons; milling duty per stamp per 24 hours, 7·49 tons; yield, 97,991·758 ozs. fine; yield per ton milled, 4·1 dwts. fine. Cyaniding: Tons treated, 475,705; yield, 77,138·976 ozs. fine; yield per ton treated, 3.2 dwts. fine. Summary of current ore treatment (on basis of tonnage milled): Milling, 97,991·758 ozs. fine, equal to 4·1 dwts. fine per ton; cyaniding, 77,138.976 ozs. fine, equal to 3.2 dwts. fine per ton; total, 175,130.734 ozs. fine, equal to 7.3 dwts. fine per ton. The actual expenditure on development amounted to £43,368 7s. 7d., as against £71,655 provided in the working costs (at 3s. per ton milled), leaving a balance of £28.286 12s. 5d., which, added to the balance at 31st December, 1912, of £127,678 16s., gives a total of £155,965 8s. 5d. standing to the credit of development suspense account at 31st March, 1913. This amount has been treated as a liability, and is allowed for accordingly in the cash position shown above.

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

Automobile Notes.

The list of members of the Imperial Motor Transport Conference which opens on July 18 states that the South African representatives will include Sir Richard Solomon, Sir Charles Metcalfe, Bart., Mr. H. G. Humby, Colonel Panzera (Bechuanaland Protectorate), the Hon. Hugh Wyndham, M.L.A. (Agricultural Supply Association of Johannesburg), Mr. Stephens and Mr. H. Twycross (Public Works Department, South Africa), Sir E. P. Solomon, Mr. W. H. Poultney (Witwatersrand Agricultural Society), Mr. Oscar E. G. Evans (South African Agricultural Union), Mr. John Mordy Lambe (Municipality of East London), the General Manager of the Beira and Mashonaland and Rhodesia Railways, Mr. A. R. Atkey (Transvaal Automobile Club), and Mr. Edward Barry (Durban and Coast Society of Agriculture and Industry). The Conference will continue for about a week. Prince Arthur of Connaught is the President.

Proposed Advisory Committee in South Africa.

The Minister for Posts and Telegraphs states that the Government fully appreciates the value of the services such a Committee could render in dealing with shipping matters as they may affect South African trade and industries, and would be pleased to see the formation of such a body. The Government understands that the functions of the proposed Committee would be to receive representations from persons interested in the import as well as the export trade of the country in connection with shipping freights, etc.; that such representations would be considered by the Committee, and, if thought to be of sufficient importance to warrant further action, a full statement of the facts, together with a suggestion or recommendation, would be transmitted to the Government with a view to its good offices being sought to bring about an adjustment. If this brief outline of the proposed Committee's duties fairly represents the attitude of the Associated Chambers of Commerce, the Government will be pleased to act as intermediary between the interests represented and the shipping companies. The Government regrets that it does not see its way to appoint a nominee on the Committee, believing that the better way would be for the various interests concerned to be free to make their representations through the Committee without any expression of opinion one way or the other by a Government official. It is understood that Sir Owen Philipps, as representing the shipping companies, is agreeable to the formation of an Advisory Committee in South Africa, and that he would be pleased to appoint a representative to attend a discussion of the Committee whenever invited to do so. In due course the Government desires to be advised of the formation of the Committee in question, and the names of the members and the interests they represent. The Committee of the Capetown Chamber have considered this communication, and approve the proposals of the Government. At the same time, they are of opinion that the proposed Advisory Com-

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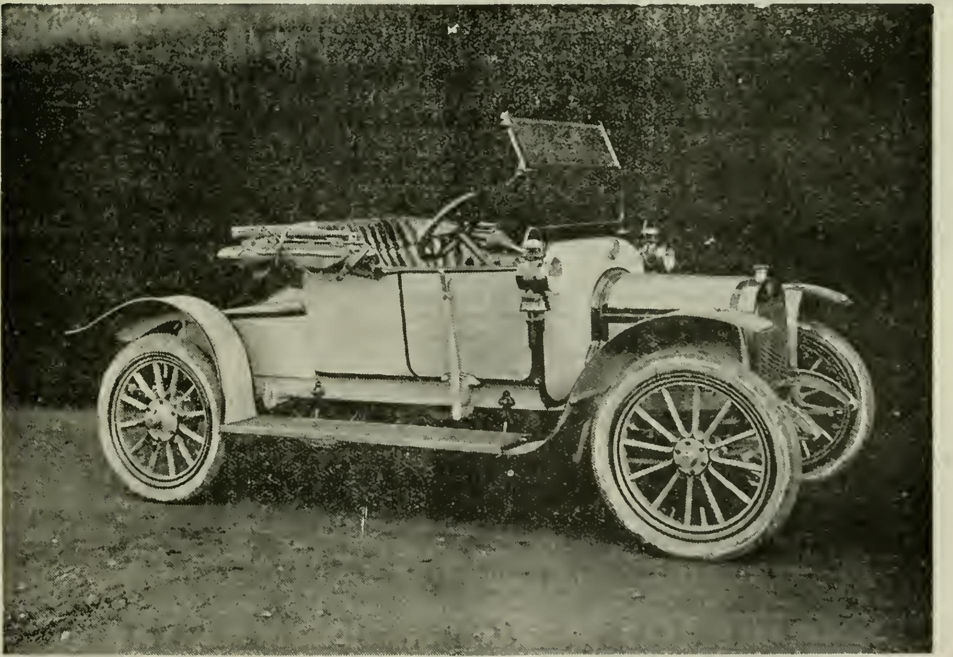

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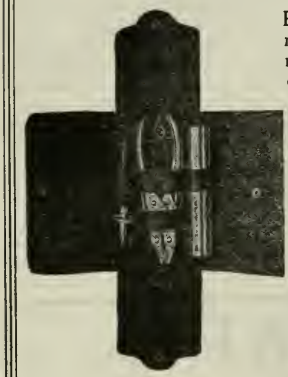

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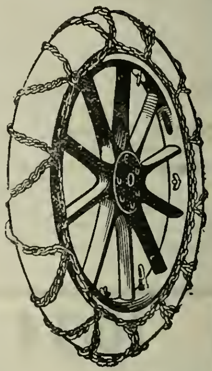

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mittee should have power to negotiate direct with the steamship companies, without necessarily soliciting the services of the Government to act as an intermediary on every occasion, and matters which the Committee is able to negotiate successfully with the steamship companies should be dealt with by that Committee. On the other hand, they are of opinion that in the event of the Advisory Committee being unsuccessful, it should then consider from time to time the necessity of asking the Government to use its good offices with the shipping companies. As far as the constitution of the Advisory Committee is concerned, the Committee recommend that it should consist of sixteen (16) members: one to be elected by the Agricultural Union; one by the Chamber of Mines; one to represent the interests of manufacturers; five to be elected by the shipping companies; and one by each of the following Chambers of Commerce: Capetown, Mossel Bay, Port Elizabeth, East London, Durban, Kimberley, Bloemfontein, and Johannesburg.

Increased Diamond Production in G.S.W.A.

Several companies—among them the Zillertal, New Karlstal, and New Phœnix—which, owing to the former prohibitive tax on diamond production, had to close down their mines, have, since the easier taxation assessment came into force, resumed working. At the same time the stress caused by the scarcity of native labour has been relieved by the arrival of 400 Ovambi boys. The efficient exploitation of the Northfield, too, is considered assured, the Koloniale Bergbaugesellschaft, a financially strong concern, having in April acquired the mining and prospecting concessions of the Diamantfelder-Verwertungsgesellschaft for M. 125,000 cash and 55 per cent. of the net profits to be earned. For the purpose of working the mines a new company with a share capital of M. 800,000 is to be floated without delay.

Treasury Gold Mines.

The Secretary writes:—"The workers having gone out on strike, the permanent closing down of the mine has been precipitated, as the small amount of payable ore remaining unworked will make it economically impossible ever to resume operations."

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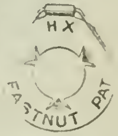

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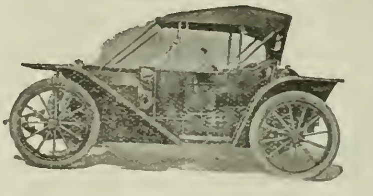

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New Patents.

246. George Walter Sharp.—Improvements in means for fixing corrugated and other sheet metal ridging and the like.
247. William Herbert Lowe.—Improvements in electrolytes.
248. (1) Alfred Whitby, (2) Josiah Whitby.—Improved pack poles for mining purposes.
249. William George.—An improved automatic back block.
250. Percy Saunders.—Composition for lining the cast steel or iron liners of centrifugal sand or water pumps and wood, iron, or steel launders.
251. Frank Corea de Reamer.—Improvements in and relating to electric switches.
252. James Charles Hoskins Vaught.—Chuck for rock drills.
253. (1) Sydney Brooks Bebrough, (2) John Frew.—A new or improved process for extracting tannin from bark, wood and other vegetable materials, and apparatus or plant for carrying out the said process.
254. Stephen Sebedina.—Preventative against rust in cereal.
255. Stephen Masters.—Improvements relating to pin and link type railway couplings.
256. Stephen Masters.—Improvements in automatic railway couplings.
257. Stephen Masters.—Improvements in railway couplings.
258. Alfred Edward Barker.—Improvements in bearings for conveyor belt idlers and the like.
259. Thomas William Stainer Hutchins.—Improvements in operating producer gas power installations.
260. Robert Blane and Jacob Donald Silcock.—Improvements in rollers for haulage ropes and the like.
261. Sigismund Banman Schlam.—Improved safety appliance for cages and skips in shafts.
262. Thonias Tregoning and John Holman.—Improvements in rock drills and detachable cutters therefor.
263. Charles Henry Morris and Alexander Davidson McNeil.—Improvements in drills and detachable cutters therefor.
264. Elijah Charles Bentley.—Improved detachable tyre to enable motors and the like to travel over deep sand.
265. (1) Thomas Holmes, (2) Arthur John Walton.—Improvements in rock drilling and like percussive tools with detachable bits.
266. John Matthew.—Improvements in electrical water heater.
267. Richard Casson Power.—An improved detachable bit.
268. Bruce W. Taylor.—Improvements in filtering apparatus.
269. Wilhelm Goert Boonzaier.—Scrapers, reamers, and burnishers for smokers, pipes, tubes, cylinders and the like.
270. Charles Washington Merril.—Process for precipitating and recovering valuable metal bearing materials from solutions, and precipitants for use in connection therewith.
271. Henry Conrad Hebig.—Improvements in tobacco stemming machines.
272. Karl Finck.—Improvements in and relating to artificial teeth.
273. Samuel Campbell Irving.—Improvements in or relating to roofing sheets.
274. John Oliver.—Improvements in tube mill liners.
275. Henry Rushton Sharp.—A new or improved preparation for use as a food or as an ingredient in food.
276. Arthur Miles.—Improvements in rollers for haulage ropes and the like.
277. Walter Bolter.—Rock drill head coupling.
278. Louis Bulbring.—Improvements in the manufacture of certain tools and implements, namely, forged shovels, spades, forks, and the like.
279. Reuben Jones.—Improvements in and relating to rock drills and detachable bits or cutters therefor.
280. Mark Randall.—Sectional metal cattle dipping tank.
281. Henry Marius Schade van Westrum.—Improvements in methods of making and maintaining roads or like surfaces.
282. Sydney Joseph Crowther Wilkinson.—Improvements in detachable or loose bits for drilling purposes.
283. (1) John Godfrey Parry Thomas, (2) The Thomas Transmission, Ltd.—Improvements in and connected with railway motor coaches and the like.
284. Nicolas Henri Marie Dekker.—Improvements in or relating to electrolytes for use in electro-metallurky.
285. Robert Robson.—Regulating feed for sand cones.
286. Oliver Morgan Babcock.—Improvements in or relating to boxes and machines for making them.
287. John Shanks.—An improved apparatus or appliance for listing drain pipes, water pipes, gas pipes, and the like.
288. (1) Albert August Jahnke, (2) National Wireless Telephone and Telegraph Company.—Apparatus for the production of high frequency oscillating currents.
289. David Ord Hume, Jr.—Improvements in gates.
290. (1) James Matley, (2) Constantine Russell.—Improvements in means for completing an electric circuit when a predetermined temperature is reached, applicable for actuating fire alarms, and for other purposes.
291. Charles Weir.—A new and improved method and means for spraying cattle and the like.

The following new companies, increases of company share capital, and notices of liquidation have been registered at Pretoria during the month of May last :—

NEW COMPANIES.

Allen Wack and Company, Ltd., 97, Commissioner Street, Johannesburg; registered May 3; capital, £50,000.

The South African Diamond Corporation, Ltd., Lewis and Marks Building, corner President and Simmonds Streets, Johannesburg; registered May 3; capital, £1,000,000.

Myrtleford Gold Mining Company, Ltd., 17, Transvaal Bank Buildings, Fox Street, Johannesburg; registered May 3; capital, £35,000.

The Western Farming Company, Ltd., Kleinfontein 315, Koster District, Rustenburg; registered May 5; capital, £2,500.

Haarhoff and Bennett, Ltd., Stand No. 109, Pim Street, Janower's Buildings, Newtown, annex Johannesburg; registered May 6; capital £500.

The Federal Building and Investment Company, Ltd., 17 and 18, Meischke's Buildings, Harrison and Market Streets, Johannesburg; registered May 9; capital, £1,100.

Rondi, Ltd., 7, Leslie Street, Wolhuter, Johannesburg; registered May 9; capital, £10,000.

H. L. Adler and Company, Ltd., Stands 9 and 10, Carr Street, Newtown, Johannesburg; registered May 10; capital, £500.

The Hopefield Syndicate, Ltd., 5, Winchester House, Fox Street, Johannesburg; registered May 13; capital, £240.

J. R. Macdonald and Company, Ltd., care of Messrs. Cliffe and Dekker, Colonial Mutual Buildings, corner Fox and Loveday Streets, Johannesburg; registered May 15; capital, £1,000.

May Bioscopes, Ltd., 58, Standard Bank Chambers, Commissioner Street, Johannesburg; registered May 15; capital, £3,000.

Juma Masgied Society, Stand No. 1,424, Kerk Street, Johannesburg; registered May 16; capital, 5s.

Pilandsberg Diamonds and Minerals, Ltd., 58, Fox Street, Johannesburg; registered May 16; capital, £25,000.

African Theatres Trust, Ltd., Empire Buildings (first floor), Kruis Street, corner Commissioner Street, Johannesburg; registered May 16; capital, £12,500.

G. and S. Syndicate, Ltd., 207, Consolidated Building, Fox Street, Johannesburg; registered May 17; capital, £1,000.

Miller and Lewis, Ltd., 40, Pritchard Street, Johannesburg; registered May 20; capital, £800.

H. Barber and Company, Ltd., 9, Jaeger Street, Hillbrow, annex Johannesburg; registered May 22; capital, £5,000.

Langverwacht Estate, Ltd., Farm Langverwacht No. 111, district Standerton, Henross Station; registered May 22; capital, £1,500.

The Licensed Victuallers' Gazette and Sporting News, Ltd., 34, Grosvenor Chambers, Loveday Street, Johannesburg; registered May 22; capital, £300.

The Reef Bioscope, Ltd., Store Brothers Buildings, Eloff Street, Johannesburg; registered May 23; capital, £102.

The Only Economic Building Association and Shilling Bank, Ltd., 21, Norwich Union Buildings, Fox Street, Johannesburg; registered May 27; capital, £10,000.

Covent Gardens, Ltd., 107-9, Corporation Buildings, Johannesburg; registered May 28; capital, £300.

Ermelo Town Lands Collieries, Ltd., 51, Exploration Buildings, Commissioner Street, Johannesburg; registered May 28; capital, £30,000.

FOREIGN COMPANIES.

The Consolidated Diamonds, Ltd., care of J. F. Back and F. A. Dunlop, 16 and 17, Transvaal Bank Buildings, Fox Street, Johannesburg; registered May 28; capital, £7,000.

Northern Claims Developments, Ltd., care of J. C. Bronte, 66, Permanent Mutual Buildings, Harrison Street, Johannesburg; registered May 28; capital, £5,000.

INCREASE OF CAPITAL.

Premier Whaling Co., Ltd., Johannesburg; registered May 3; capital increased from £60,000 to £75,000.

Eastern Whaling Co., Ltd., Johannesburg; registered May 3; capital increased from £60,000 to £72,500.

Witwatersrand Gold Mining Co., Ltd., Johannesburg; registered May 22; capital increased from £425,000 to £475,000.

VOLUNTARY LIQUIDATIONS.

M.F. (Rhodesia) Proprietary, Ltd., Johannesburg; Komati Mines, Ltd., Johannesburg; Transvaal Iron and Steel Co., Ltd., Johannesburg; Metlapetsi Alluvial, Ltd., Johannesburg; Anglo-French Motor Garage, Ltd., Johannesburg; C. Lewis and Co., Ltd., Johannesburg; Ferguson Champ d'Or Gold Mining Co., Ltd., Johannesburg; Fortuna Investments, Ltd., Johannesburg.

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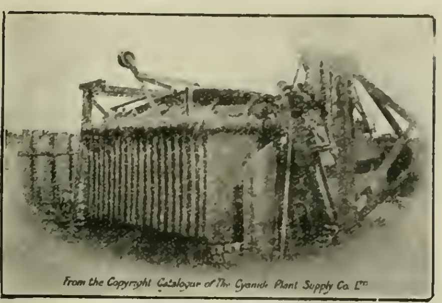

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QUARTERLY REPORTS.

City Deep.

The following is the report on operations at the City Deep for the quarter ended 31st March:—Profit for the three months amounted to £83,673. Number of feet driven, sunk and risen, exclusive of stopes, 3,775. This footage includes 7 feet sunk in No. 1 vertical shaft. The reef disclosures were as follows:—Main Reef: Distance exposed, 1,055 feet; width, 37 inches; assay value, 15s. 7d. Main Reef Leader: Distance exposed, 1,685 ft.; width, 19 in.; assay value, 114s. 6d. Ore received from mine, 146,799 tons; waste sorted out, 11·8 per cent.; tonnage crushed, 130,000; number of stamps operating, 150; number of tube mills operating, 7. Mill yield per ton, 22s. 9d.; assay value of pulp, 15s. 3d.; total, 38s. Total yield, 57,398 ozs. fine; total yield per ton, 37s. 1d.; accumulated slimes, tonnage treated, 6,900; accumulated slimes, yield, 742 ozs. fine. The development footage accomplished was 3,775 feet, an increase of 1,280 feet when compared with that for the previous period. The increase is the result of more developing points having been restarted when the labour position became more satisfactory. Driving was commenced on the 2nd and 10th levels, at No. 2 shaft, which are new levels above and below the present ore reserves, exposing Main Reef Leader of good grade. The bottom of No. 1 vertical shaft has been cleaned up and sinking commenced. Operations have, however, been temporarily suspended, until the sumps for the electrical pumps have been cleaned, the bottom of the shaft serving as a sump in the meanwhile. Petrol locomotives for tramming have been introduced on the 8th level, with promising results, and the animal traction on this level will be transferred to the 9th level, thereby releasing labour from tramming for productive work. The total number of natives in the company's service at the end of March was 4,508, as against 3,516 at the end of the previous period. There is an amount of £80,495 still to be spent on account of authorised capital expenditure; against this, it will be remembered that a net cash sum of £65,272, accumulated from working profits, was brought forward at the beginning of the year. The action instituted by the Federation Company, Ltd., against this company was set down for hearing on the 14th March, 1913. The Federation Company, Ltd., failed to appear. The Court granted absolution from the instance, with costs in favour of this company in regard to freehold titles, and gave judgment with costs in favour of this company as regards all its mining and claim titles, upholding the same as being in perfect order. The twelfth ordinary general meeting of shareholders will be held in the board room, The Corner House, Johannesburg, on Thursday, 5th June, 1913, at 3.30 p.m. The memorandum of association and amended articles of association, approved by shareholders at special general meetings in January and February, were registered on 6th March, 1913.

Bantjes Consolidated Mines.

The following is the report on operations at the Bantjes Consolidated or the quarter ended 31st March:—Balance of working expenditure and revenue account, £19,119. Number of feet driven, sunk and risen, exclusive of stopes, 5,611 feet. The reef disclosures were as follows:—Main Reef Leader: Distance exposed, 645 feet; width, 23 inches; assay value, 29s. South Reef: Distance exposed, 2,805 feet; width, 12 inches; assay value, 89s. 3d. Ore received from mine, 93,257 tons; waste sorted out, 11·4 per cent.; tonnage crushed, 82,650; number of stamps operating, 100; number of tube mills operating, 3. Mill yield per ton, 16s. 2d.; assay value of pulp, 12s. 8d.; total, 28s. 10d. Total yield, 27,582 ozs. fine; total yield per ton, 28s. The development accomplished, as anticipated in the last report, shows further improvement, and the footage at 5,611 feet is an increase of 1,150 feet over that of the previous quarter. Development is now in full swing in all sections of the mine. The haulage on the 6th level, main drive, has been completed, and is now ready for use with animal traction. The east incline shaft has been dewatered to below the 9th level, and preparations are being made to restart development on this level. The South Reef disclosures for the quarter are the same as those of the previous one, and the values obtained in the lower levels on this reef are satisfactory. The disclosures on Leader have not been so good, but good values have been obtained in certain areas in which payable ore will be developed. The development suspense account now shows a credit of £19,513, a further addition having been made to this fund during the quarter, in spite of the largely increased development accomplished. The working costs show a reduction of 4s. and the yield one of 3d. per ton milled; and the profits, owing to the increased tonnage of 5,500 tons milled, show an increase of £1,343. A record crushing of 29,850 tons was accomplished during March, and the labour position is still being maintained. The capital expenditure for the quarter amounted to £992. Authority has been given to erect a new hoist at the central shaft, and an amount of £14,665 for this item is still required to complete authorised work. No other capital expenditure is in hand at the present time. The sixteenth ordinary general meeting of shareholders will be held in the board room, The Corner House, Johannesburg, on Friday, 6th June, 1913, at 11 a.m. The memorandum of association and amended articles of association approved by shareholders at special general meetings in January and February, were registered on 1st March, 1913.

The Village Main Reef Gold Mining Co., Ltd.

(INCORPORATED IN ENGLAND.)

DIVIDEND No. 25.

NOTICE IS HEREBY GIVEN that a Dividend of Thirty-five per cent. (Seven shillings per share) has been declared, payable to all Shareholders registered in the Books of the Company on the 30th June, 1913.

The local Transfer Books of the Company will be closed from the 1st to the 6th July, 1913, both days inclusive.

Dividend Warrants in favour of South African Registered Shareholders will be payable in Johannesburg on or about 31st July, 1913.

By Order of the Local Board of Directors,

RAND MINES, LIMITED,
Local Secretaries.

S. C. STEIL,
Joint Secretary.

The Corner House,
Johannesburg, Transvaal,
27th June, 1913.

68552

VISIT TO SOUTH AFRICA

OF

Dominions Royal Commission.

IT is hereby notified for general information that the Commission appointed by His Majesty the King to inquire into and report upon

> the natural resources of the Dominion of Canada, the Commonwealth of Australia, the Dominion of New Zealand, the Union of South Africa, and the Colony of Newfoundland; and, further, to report upon the development of such resources, whether attained or attainable upon the facilities which exist or may be created for the production, manufacture, and distribution of all articles of commerce in those parts of the Empire; upon the requirements of each such part and of the United Kingdom in the matter of food and raw materials, and the available sources of such; upon the trade of each such part of the Empire with the other parts, with the United Kingdom, and with the rest of the world; upon the extent, if any, to which the mutual trade of the several parts of the Empire has been or is being affected beneficially or otherwise by the laws now in force, other than fiscal laws; and, generally, to suggest any methods, consistent always with the existing fiscal policy of each part of the Empire, by which the trade of each part with the others and with the United Kingdom may be improved and extended

is due to visit the Union of South Africa in December next for the purpose of taking evidence.

The itinerary of the Commission will be published at a later date, and particulars will, at the same time, be given respecting the places where and the dates on which evidence will be heard.

In order to prepare the way for the Commission's labours, the Union Government has appointed Mr. Frank Robb, Acting Divisional Superintendent, South African Railways, who will be styled "The South African Officer, Dominions Royal Commission," and whose address is Railway Offices, Port Elizabeth, to take charge of the local work of the Commission. All local arrangements for the conduct of the Commission's inquiry in South Africa are in Mr. Robb's hands, and application should be made to him for such information as may be required respecting the subjects that will come under review by the Commission, or any other matters connected with the Commission's visit.

The success of the Commission's visit will depend very greatly upon the effective co-operation of Chambers of Commerce and Trade and of other representative bodies in South Africa constituted for the stimulation or protection of trade, commerce, or industry. It is, therefore, requested that any applications which may be made to such bodies by Mr. Robb for information or advice may be accorded favourable consideration.

JAMES R. LEISK,
Secretary for Finance.

The Treasury, Pretoria.

THE SOUTH AFRICAN
Mining Journal,
WITH WHICH IS INCORPORATED
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Notes and News.

The Falcon Mystery.

The mystery of the Falcon Mines in Rhodesia has now apparently been cleared up. Much perturbation was caused among shareholders by the official statement that Mr. A. H. Ackermann, the engineer for the Chartered Company, and Mr. Pickering of the B.S.A. Mines Development Company, had expressed doubts as to the correctness of the assay plans. The control of this company recently passed from the Rhodesia Consolidated to the Consolidated Gold Fields, and the last estimate of the ore reserve was 730,000 tons, averaging 5 dwts. gold and 3 per cent. copper. The cable sent from the mine in answer to Mr. Ackermann expresses continued confidence in the sampling results. The erroneous nature of the latest assays of the Falcon Mines is now admitted as per the following cable received: "I am informed officially that the assayer to Ackermann Pickering has stated that his results are inaccurate and that result of his check 53 of his first assays for copper show increased value of practically 24 per cent., all round, or an increase of nearly one-fourth in copper values in favour of the mine.—J. G. McDonald."

* * * *

Luipaardsvlei.

The excellent profits shown by the Luipaardsvlei for June—given elsewhere in this issue—reflect very favourably on the efforts of Mr. Saner, the general manager. The fact that the grade of ore crushed was 5·2 dwts. while the ore reserves average 5·8 dwts. goes to show that selective mining is not practised at the property, having regard to the fact that the residues are ·3 dwt.

* * * *

Closing the Freiberg Mines.

Glückauf reports that the mines of Freiberg, Saxony, will be closed at the end of September this year, but probably one mine will be kept open for the purposes of the Bergakademie and the Bergschule. The Freiberg mines were first opened in 1168 and in the next century they were actively exploited. In 1572 they made their maximum production. In 1791 they supported a population of 5,187 souls. In 1878 there were 38 mines in operation, employing a technical staff of 250 men and about 6,000 miners and labourers. The fall in silver in 1893 affected these mines severely and since then their production has been steadily dwindling. From beginning to end they have yielded over five million kilograms of silver. Many South African engineers, who obtained their education at Freiberg, will hear with sorrow of the final closing of its famous old mines.

* * * *

Sand Filling at the Robinson Deep.

Very interesting work is now proceeding at the Robinson Deep in connection with sand filling, and it is understood that an important paper on the operations will be read before a local technical society at an early date. Sand filling was commenced at the Robinson Deep mine about three months ago, and the arrangements have now been so far perfected that practically the whole of the current sand is lowered into the mine. At the Robinson Deep the *modus operandi* differs substantially from the method originally introduced from Germany, and a fine appreciation of such technical niceties as the relative quantities of water and of solid material to ensure satisfactory "packing" has been arrived at. The Robinson Deep sands are sent underground through a borehole 1,700 ft. deep and the surface transport of sand to this borehole is carried out on the gravitation principle, whereas at the Simmer and Jack surface transport is achieved by pumping. A full and detailed description of the Robinson Deep sand filling operations will certainly be received with great interest.

* * * *

Native Rations on the Mines.

A correspondent signing himself "Pondoland" writes:—"A a time of such stress and uncertainty as the present, I beg leave to ask what amounts of native rations the mines of the Witwatersrand are in possession of? The question is one of the utmost importance for very obvious reasons. In my humble opinion the compounds should have in reserve enough mealie meal to last the native army of the Rand for at least three weeks." We understand the supply of native rations on the mines is sufficient for at least a fortnight. We endorse our correspondent's suggestion.

* * * *

Aiding the "Small Man."

Mr. Warington Smyth, the Secretary for Mines, in evidence before the Select Committee on Public Accounts, gave the history of the vote of £20,000, of which £15,000 is for roads and bridges in assistance of mining:—"For some years," he said, "there has been a public demand for Government to assist mining development in the way of providing machinery, such as the erection of central batteries, as in Australia, and in other ways. That particular method is a difficult problem, because once you have incurred the expenditure it may happen afterwards that the works are rendered useless to anyone. If, for example, you erect a battery and the mining propositions in the neighbourhood do not fulfil their promise, then you are left with your battery on your hands. They have had considerable losses in that way in Australia. The best way we can help people in promising districts is to give them a road, and then, whatever becomes of the mining venture the road remains as an asset to the district. It assists the mining people because they can get their transport so much cheaper, and they are enabled to get up heavy plant which otherwise they would probably not be able to bring to the locality. A certain amount is allocated to each Province."

* * * *

African Association.

The report of the African Association, Limited, for the year ended December 31 last states that the trading profits for the year amounted to £49,949 and dividends received £12,152, making a disposable total of £62,101. After paying the preference dividends, the directors recommend a final dividend of 7 per cent. on the ordinary shares, making 12 per cent. for the year, and a bonus of ½ per cent., while £6,440 is added to ordinary shares dividend fund. The founders' shares receive a dividend of 25s. per share.

* * * *

Miller Gold Mine Sold.

Mr. J. C. Burchmore this week submitted for sale, at his mart, 111, Fox Street, the property, buildings, and plant of the Miller company, situated on the farm Haenertsburg, district Pietersburg. The sale, which was without reserve, realised the sum of £300.

* * * *

Modder Deep.

The following are particulars of work recently done on the Modder Deep:—During the quarter ended June 30 last 3,453 feet were driven, risen or sunk, inclusive of 302 feet sunk in the incline shaft; 3,455 feet were sampled, showing an assay value of 9·6 dwts. per ton over 40·6 inches. Since the commencement of development work a total of 8,529 feet has been driven, risen or sunk. In respect of 1,197 feet the reef has not been exposed, and 290 feet had not been sampled at the end of the quarter. The balance of 7,042 feet assays 7·9 dwts. per ton over 40·8 inches. On June 11 an additional flow of water was met with, causing a temporary stoppage of development work and necessitating the immediate installation of more pumps, which were fortunately obtained locally. Portion of the new pumping plant having been installed, development work was to have been re-started on June 30, but this was not possible owing to the general strike, and consequently the water in the mine accumulated again to a certain extent. The water in the mine is now under control, and development work will be re-started on the 14th inst. The full capacity of the pumps installed will then be 530,000 gallons per 24 hours, and this capacity will be increased to about 710,000 gallons per 24 hours in a few days' time. In addition to this, the bailing capacity, without interfering with development work, is 450,000 gallons per 24 hours. Against this, the total quantity of water making in the mine has fallen to about 775,000 gallons per 24 hours.

Mining Machinery in South Africa.

In a series of articles which recently appeared in this journal the magnitude of the market existing on the Rand for mining machinery was emphasised. The importance to mining in British South Africa to Home manufacturers is well shown in a return recently issued in London, which sets forth the exports of British machinery to various countries and dependencies for the five months ended May 31st for the past three years. The table is of special interest and importance, and is accordingly reproduced. The figures as to quantity and value are as under:—

BRITISH.	QUANTITIES.			VALUE.		
To	1911. Tons.	1912. Tons.	1913. Tons.	1911. £	1912. £	1913. £
Europe	545	712	725	22,750	31,597	42,070
U.S.A.	48	7	31	1,866	546	1,912
South America ..	643	427	675	31,184	23,404	30,134
British S. Africa	6.025	5,538	6,075	205,736	186,985	201,956
British E. Indies...	538	672	651	20,433	28,870	34,061
Australia	854	583	540	35,785	21,879	17.599
New Zealand ...	430	277	268	12,720	8,563	13,522
Other Countries ..	2,646	2,434	2,900	90,546	91,077	97,491
Totals	11,729	10,650	11,865	£421,020	£392,921	£438,745

The enormous preponderance of British South Africa is especially noticeable. Out of a total value of £1,252,686 for all countries for the three periods, British South Africa, it will be observed, took nearly one-half—£594,677. Figures such as these speak more eloquently than whole sheaves of mere argument as to the importance of the South African Mining Machinery Market.

* * * *

Gold and Silver.

"I have endeavoured to discover as to how and when the ratio of value between gold and silver commenced, and as to what was its origin," said Mr. Bedford McNeill, in his presidential address before the Institution of Mining and Metallurgy. "Sir David Barbour has called my attention to an interesting theory of Professor D'Arcy Thompson, 'that the origin of the ratio may have been astronomical, gold being associated with the sun, and silver with the moon; the period of the earth's revolution round the sun being 365¼ days, and that of the moon round the earth 27·32 days, it will be found that the ratio between these figures is very nearly 13⅓, and this figure 13⅓ was the ratio that was fixed between gold and silver during the Babylonian Empire (2000 B.C.) down to the Lydian Empire (500 B.C.).' Professor D'Arcy Thompson has also pointed out that the Lydians made coins of what was called 'electrum,' and reckoned one electrum coin as being of the same value as 10 silver coins of the same weight. It was supposed that the Lydians were unable to separate the gold from the silver, but when we find by assay that the proportions in these old coins of gold to silver were approximately as 73 and 27, and calculating gold as 13⅓ times as valuable as silver, and we find that an electrum coin would be worth exactly 10 silver coins of the same weight, we cannot help but admit that the Lydian assayers must have been well versed in the science and practice of their art, and that such figures cannot be mere coincidences."

* * * *

The Antelope Gold Mine.

At the ordinary general meeting of the Antelope Gold Mine (Rhodesia), Limited, held at the Cannon Street Hotel in London in mail week, Mr. Robert G. Fricker (chairman), who presided, said:—The development during the past year has added 22,000 tons to the ore reserves. That is, of course, a very small amount, but it is really no criterion of the amount of work done, the benefit of which, as Mr. Fraser states in his report, will accrue to us later on. Indeed, during the first quarter of this present year the reserves were increased by 16,685 tons, which had an assay value of 10·38 dwts., or nearly 45s. per ton, in value over the stoping width. At the end of March, therefore, the reserves on the main reef were 141,286 tons, of an average assay value of 10·2 dwts., besides about 20,800 tons in the eastern section and on the parallel reef, as set out in the report, and it is anticipated that this will be materially increased by the time the mill is ready to start. I am glad also to notice that the cost of the development per foot in January last had been reduced to 56s. 7d., as against 79s. for the previous year, a material and important reduction. I might point out that by the time the mill starts we should have something like four years' supply of ore opened up in the mine. Apart from this development, a considerable amount of work has been carried out during the year in getting the mine into order for stoping, and by the time the reduction plant is completed everything underground will be ready to supply ore to the mill. Now, with regard to the reduction plant, as far as I can gather, there has been only a slight delay in the delivery of some of the structural steel work. Nearly all the plant is now on the ground, and the work of erection is going on as rapidly as possible, and according to our latest cable the plant should be ready to start crushing by the end of December—a month later than we anticipated—not a great deal, I think, considering the difficulties there have been in regard to drought and want of labour. All the foundations for the main engine and the compressor plant are ready. The iron framing for the furnace-house and grinding-pans is in course of erection, and the boilers are in position, and we are in hopes that we shall be in a position to start milling at the date mentioned.

* * * *

A " Rise " in Diamonds.

A recent telegram recording a sensational rise in the price of German South-West African diamonds was seized upon by the advocates of a cutting industry (remarks the *Argus*) to illustrate their point that the world is so hungry for diamonds that it does not care what it pays for them. The actual facts have come to our notice, and they are so very interesting that we venture to make them public. It appears that the producers of German South-West Africa were only getting from the Regie 29s. 6d. per carat for their diamonds, and were certain that they were not getting anything like market value. The Regie, it may be explained, had been selling the stones to an Antwerp syndicate, and not disposing of them in the open market. Pressure was accordingly brought to bear on the Government, who agreed to put the matter to a test by calling for tenders for a large quantity of these diamonds. The English Diamond Syndicate (not the De Beers Company) tendered 45s. per carat. The Antwerp syndicate, who had been buying all these diamonds at the low figure named, now tendered high, and got the diamonds at 46s. Thus the Antwerp syndicate jumped suddenly from 29s. 6d. to 46s., although diamonds in the open market have hardly moved in price this year. Of course, the Antwerp syndicate had been getting all along the full market price for the diamonds, and were making pots of money out of the producers. It seems pretty clear that the enhanced prices are owing to the London syndicate coming on the scene, and yet Senator Munnik, in the late debate in the Senate, represented the whole incident almost as though De Beers had been conspiring with somebody to depress the price of German South-West African diamonds.

* * * *

Premier Shares and " Life."

Mr. Ross Frames, in giving evidence before the Select Committee on Diamond Cutting, explained that the original Premier share stood at an equivalent of £73. They had spent close on £2,000,000 on equipping the mine, " but instead of watering our capital, as more expert financial people do, we were more simple-minded, and used profits for the purpose. It was stupid but clean finance." He asked his questioner whether the company could have raised two millions from the public on a 1s. per load margin and 60 per cent. of the 1s. to go to the Government. Twenty-one years ago he bought an engagement ring for £25, a similar ring to-day would cost £60. Asked as to the life of the diamond mines, Mr. Frames declared that of the Premier, from a financial view, is eternity. " Anything over 25 years, from a financial point of view, is eternity." Mr. Frames added that he hoped the life of the other mines was very much less. The prospect of a long life was one of the factors that caused the shares to advance in price. " If no other mine is discovered in the next 20 years, the Premier could make the price anything it liked, because it would probably have a monopoly."

TOPICS OF THE WEEK.

THE SETTLEMENT OF THE STRIKE.

Elsewhere in this issue an attempt is made to gauge the exact effect of the short-lived strike of last week upon the mining industry, and we will content ourselves here with placing upon record the terms of the settlement, observing the honourable understanding of the Rand Press to withhold criticism for the present. The original conditions laid before the representatives of the strikers by the Prime Minister, and accepted by them, were as follows:—(1st) The strike to be immediately declared off, and the strikers to return to their homes, and all further disturbances to cease, and no further property to be destroyed. (2nd) The New Kleinfontein strikers to be reinstated, and the Government to grant suitable compensation to the strike breakers, who will in no way be victimised by the strikers. (3rd) The strikers on others mines to return to their work, and to be taken back as mining operations are resumed on their mines, and no victimisation to take place. (4th) The representatives of the workers are at liberty to lay any other grievances before the Government, who will inquire into them. However, in view of the discontent expressed in some quarters at the indefiniteness of some of the terms of this settlement, it was decided by the signatories to hold, on behalf of the strikers, another meeting with the Prime Minister, and as a result of the meeting certain amendments to the original settlement were arranged. They are: With reference to clause 2, concerning strike breakers, it was agreed " That this provision was introduced at the instance of the Government, and as a responsibility which they had assumed, and forms no part of the obligations undertaken by the representatives of the men." With reference to clause 3, it was agreed that if any of the men were unduly kept from returning to work that representations should immediately be made to the Government; in consequence of which there need be no fear of any man being victimised. With reference to clause 4, it was agreed that the Government is prepared to meet a representative deputation of all workers or to accept such methods as the workers' representatives may decide on, to inquire at once into and determine on general grievances and demands arising out of the general strike, this to include railway workers. The Government will cause immediate inquiry to be made with regard to the question of necessary provision for the dependents of those who were killed or permanently injured during the strike. Clause 6: With reference to men in gaol or on bail through acts arising out of or through the alleged contravention of the Industrial Disputes Prevention Act or for any act in connection with the general strike other than criminal acts, the Government would be willing to make representations to the Department of Justice with a view to getting sympathetic consideration of all such cases. It will be remembered that the law of the Union in regard to industrial disputes, so far as the Transvaal is concerned, is embodied in what is known as the Industrial Disputes Prevention Act of 1909. That law was designed specially to meet the needs of the mining industry: it was passed practically unanimously by the Transvaal Parliament; and until it is superseded by an Act of the Union Parliament, it is still the law of the Transvaal. The law does not make strikes as such illegal, but its intention is to prevent strikes, and to that end it provides that when a dispute arises, both employers and employed shall be compelled to think, and to think again, before they are permitted to resort to a lock-out or a strike: and to assist them in the process they can have a Board of Investigation. If second thoughts are futile: that is, if no agreement is arrived at either during the Board's inquiries, or as a result of the Board's investigations, then the law stands aside. But until these conditions are fulfilled, Section 6 prescribes that it shall be unlawful for " (a) an employer to declare a lock-out, or cause a lock-out to be declared, or to aid in any manner the declaration or effecting of a lock-out; or (b) an employee to go on strike or to cause a strike; or (c) any person to incite, encourage, or in any other manner aid an employer in effecting, declaring, or continuing a lock-out; or (d) any person to incite, encouarge, or in any other manner aid employees in going or continuing on strike on account of any industrial dispute." The strike leaders arrested under clause (d) have all been released, and the openly-expressed intention of the railway workers to ignore it likewise would seem to make the Act a dead letter. The list of grievances to be formulated by the men on the mines will be awaited with interest, and if there be any genuine and general desire to alter things—which we doubt—the mining companies are certain to meet the men's wishes in the proper spirit.

A STRIKE LESSON

In a judgment delivered by Mr. Justice Heydon in the South Wales Arbitration Court, a report of which is contained in the Australian papers brought by the last mail, there are some remarks which may be commended to the attention of all workmen, particularly those in the Railways, who are now being urged to follow the example of the Rand miners. Some fifty porters employed at the Darling Harbour had been summoned to show cause why they should not be penalised for striking, and in sentencing them to pay a fine of £10 apiece, the learned judge, whom Labour specially trusts in arbitration, passed some scathing comments on the spirit of the new Unionism. He pointed out that at the very time of the strike at Darling Harbour, an Industrial Board was considering an award which distributed no less than £60,000 a year in additional wages among the railway employees of the State, and then he went on to say: "He thought the case was extremely bad. The railways of the country were simply indispensable to the business and social life of the community. Even their partial stoppage caused the utmost damage and inconvenience, and the defendants knew perfectly well that what they began might go on and paralyse the whole service. They were placed in charge of this immensely important section of work by their fellow-citizens, to whom they owed their positions," but, "like spoilt children, all they could see was that they were not getting their own way in every thing. Instead of looking on what they had as the gift of a fair-minded and generous community, they seemed to have considered it as the spoils of a conquered community: a community to be kicked and outraged at their will, and to be further despoiled and insulted at the earliest opportunity. It was an evil sign of the times that this should be the attitude of employees towards not merely private capitalists, but the State itself." It was this "temper and attitude of mind which was the most profoundly disturbing feature of the strike, which gave it, to a certain extent, the character rather of an incipient rebellion than of a strike." And Judge Heydon went on to pillory the spirit of insolent injustice which not only asks for the recognition of Union labour by the State and by private employers, but expects, when this recognition is accorded, that the instructions of the Union should in all cases be final. "Yet no doubt the Union to which they belonged which thus sets its instructions above duty to the public, and even above the law itself (exactly as do the secret societies of China and Italy), quite thinks that its members should have preference of employment over workers who have entered into no such compact. Let its leaders beware lest they set the country thinking that the preference should rather be to those who still set their loyalty to the State and their duties as its employees above the dictation of any private body, and who show that they will not, at whosoever's call, wreck the interests and destroy the property of which they have undertaken the care." The railway employees of the Union should ponder this warning. They will find Judge Heydon a much safer guide than most of their advisers.

RAND GOLD AND THE MONEY MARKET.

Had the three days' strike continued it is now clear that the cessation of gold production from the Rand would have had a serious effect on the money markets of the world. The trouble happened to fall at a specially inconvenient moment from the standpoint of world finance. The bank rate of discount may be said to vary according to the quantity of coin held by the banks, and during recent months there has been in Europe the keenest competition for gold. A few weeks ago, in spite of large purchases, the gold reserve at the Bank of England was very substantially lower than it was at the same date last year, and the bank rate has now been standing at 4½ per cent. for some months, without much prospect of declining. Money, in other words, has been "tight," and loans have been difficult to obtain. This, as the *Cape Times* explains, has been due partly to Germany's enormous purchases of gold, and this in its turn may be explained by the fact that throughout the critical times through which Europe has recently been passing, vast sums of money in coin have been withdrawn from the banks, and are being hoarded on the Continent until the international horizon has cleared. The result has been that, in spite of the enormous output of gold from the Rand, there has been an actual scarcity of money, and the world has been learning once more the lesson that after all gold is the basis upon which the whole banking system ultimately rests. For when gold is plentiful the banker lowers his rate of discount; credit is increased; and loans are facilitated. Recent issues of the *Statist* and *Economist* are sufficient to show that the converse is the monetary position to-day. Money is scarce; the gold reserves are lower than usual; loans are extremely difficult to procure; and, as South Africa has cause to know, the underwriters have been saddled with immense blocks of new issues in recent months. Had the European situation definitely cleared, it is probable that monetary circles in London and on the Continent would have regarded the temporary interruption of the gold supply from the Rand as a matter of minor consequence, which would have been completely outbalanced by the increased security following upon an international settlement. But those hopes have not yet been realised. The hoarding of gold is not likely to end until the horizon is clear, and in the meantime the scarcity of coin continues. The stream of gold from the Rand amounts to a weekly shipment of about £800,000 or more. A shortage would increase the financial stringency very materially, more especially at a time when, owing to the autumnal harvest movements in the United States, the American demand for gold will be very heavy. The latest files of the financial papers anticipate also a further heavy drain on gold by Berlin during the autumn. In its issue of June 7th the *Economist* considers that London may soon have to take steps to protect its gold reserve against the autumn, and it remarks on the fact that the reserves of coin and bullion at the Bank of England are three millions lower than at the corresponding period of last year, a relation which, according to this week's telegrams, still holds good. Clearly, the money market was relieved when the danger passed.

THE STRIKE AND AFTERWARDS.

What It Means to the Industry—Taking Stock of the Position—Effect on Capital and Native Labour—Some Outstanding Considerations—No Damage Done to Equipments.

After the cataclysm of the past few days it is pleasing to be able peacefully to take stock of the position. Such an upheaval as the Rand witnessed at the end of last week would seem to destroy the continuity of industrial life along the Main Reef series, but from the debacle several facts, which will be hailed with general satisfaction, emerge

Comforting Facts.

In the first place law and order have been restored. There have, it is true, been one or two isolated acts of violence along the reef since Monday, but it is generally felt that no real measure of importance need be attached to them. Secondly, the men are everywhere returning to work. Naturally re-engagement will be attended with some little disputes and difficulties, and at the New Kleinfontein there is the question of compensation to strike breakers to be settled. But these troubles are very insignificant in comparison with the great disaster that hung over the mines last week, and there is no reason for thinking that they will not be speedily and amicably settled. Thirdly, the mining properties remain intact and undamaged. No powers of anarchy can disrupt the greatest asset of the mines—the actual ore, either blocked out and in reserve or as yet to be developed. Of the former class of ore the Rand possesses something like one hundred and fifty million pounds worth; of the latter class no one can tell the value. These are fixed and unharmable assets, and, of course, their safety can never be in question. But grave fears were at one time entertained for the millions of pounds' worth of machinery without which the value of this ore could never be realised. It speaks well for the restraint and commonsense of the strikers as a whole that no damage was done to the equipments of the mines. We are unable to learn of a single case of destruction of or injury to plant, and the men have thus, on their return to work, found the mines in the same condition as they left them. The damages suffered by the industry may, therefore, be resolved into two classes: (a) Damages suffered through loss of prestige; and (b) damages suffered through cessation of milling operations and the disorganisation resulting from the "downing of tools" by the entire army of the Rand's white employees.

Capital and Revolutions.

As to the injuries arising from the former cause it would be futile to attempt to belittle them. A visitor who had been present in the capital of the Witwatersrand on Friday or Saturday could not have refrained from asking himself "Is this a big industrial city in the British Empire or a Central American town in the throes of bloody revolution? Appearances certainly favoured the opinion that Johannesburg was the Republican capital of Nicaragua with the Revolutionaries in possession.

Capital fights shy of States susceptible to revolutions. Some of the Central and South American Republics have natural resources of the very first magnitude, but the investor, the man who provides the sinews of industry, keeps his hand in his pocket. "I do not want to throw my money into the crater of a volcano," he says. South Africa cannot afford to lose the support and sympathy of the financial world. If we completely alienate ourselves from Oversea capital ruin will stare us all in the face very quickly. The Rand should take to heart a lesson from the sorry tale of the week-end's happenings. The loss to the industry and to the country at large from cessation of milling operations is most difficult to estimate.

The Daily Output.

In May the mills ran for 28 days, and each of these days meant an output of £115,500, the distribution of £76,250 for working expenses, and the earning of £39,250 in profit for Government and shareholders. This, quite apart, too, from the sums of money distributed by mines undergoing development and equipment. Four days' complete idleness would mean curtailment of production by nearly half a million sterling. But the direct results of the strike are not to be gauged in this manner. Anyone who has some knowledge of the working of a large Rand mine will readily understand that disorganisation for even a day is inevitably attended by consequences, the cumulative effects of which may be felt for a long time afterwards.

An industry employing 20,000 white men and over 200,000 natives is not to be thrown out of gear and then restarted without the meeting of a multitude of minor difficulties which only time and the earnest co-operation of everyone can brush aside. Discontent amongst natives at many mines has introduced further complications. It is, therefore, impossible to estimate what the decline in the July output in comparison with that for June will amount to. It is also out of the question to attempt to assess the total damage from all causes suffered directly and indirectly. The Rand must seek consolation from the fact that the great strike is over and that the mines, in so far as their tonnages of ore and equipment are concerned, have had no actual injury done them.

Northern Transvaal Lands.

The report of the Northern Transvaal Lands Company, Ltd., for the year ended 31st December last, presented to the twelfth ordinary general meeting on the 30th June, states that, after deducting the cost price, the result of the sale of five farms to Northern Minerals (Transvaal), Ltd., has been allocated as follows:—To profit and loss account, £3,520; expenses of formation of Northern Minerals (Transvaal), Ltd., and underwriting commission written off, £1,480; reserve created against shares held in Northern Minerals (Transvaal), Ltd., £7,707. The net profit for the year is £2,403, leaving a debit balance at profit and loss account of £3,026. An amended schedule of properties shows that the total area is 274,407 acres, in addition to which the mineral rights of these farms are retained. The negotiations with the Government for the sale of certain farms in the Springbok Flats district did not mature. The directors have, however, accepted an offer for a farm at a price showing a good profit to the company, which will appear in next year's accounts. This sale, together with other recent inquiries for farms, indicates that the value of land in the Transvaal is being more fully recognised. The rentals received from the company's farms again show a slight increase over last year. Grasvalley: Owing to the group to whom prospecting rights were granted not having formed a syndicate for the development of this property with others in terms of the agreement entered into with them, the agreement has lapsed, and in view of the developments on adjoining properties the directors refused to renew the agreement on the terms suggested. Northern Minerals (Transvaal): Commissie Rust (8,040 acres): A small portion of this farm has been opened up and some stones of good value were recovered. The method of working, however, was too expensive on account of the huge rocks and boulders found in the deeper layers, necessitating mechanical appliances for their removal. Work has, therefore, been suspended for the present, but the operations carried out have proved the existence of diamonds in the alluvial. Kranskloof (7,294 acres): Some prospecting has been conducted since the beginning of September, 1912. Indications of tin have been found, but no payable deposits have so far been located. The prospector is now working on Vaalpenskraal, another tin proposition. Voorburg (9,798 acres): Arrangements are in progress for opening up the extensive coal outcrops on this property, which have been traced for over a mile. According to latest advices from South Africa, the railway to the Messina copper mines, which will pass through Voorburg, will reach this property by the end of this month.

THE RAND'S DIVIDEND RECORD TO DATE.

Sums Distributed by Leading Mines—Some Remarkable Records.

Hereunder we present a tabulated statement setting forth the sums of money distributed to date by the most prolific dividend-paying mines of the Main Reef series. A casual glance will suffice to establish the remarkable fertility of the mines in question as regards distributable profits and at a time when the Rand is in the doldrums and capital looks askance at these gold fields the list is both timely and interesting. No other gold mines on earth can point to dividends of such magnitude as are contained in the accompanying schedule. It may at the same time be remarked that the winning of the colossal sums in question has only been rendered possible by the expenditure of a very much larger aggregate on salaries and wages to employees, on machinery and on stores, and if there was set beside the appended table a statistical statement showing the amounts expended by the various mining companies on capital and working costs, it would certainly show that the Rand is a great deal more than a mere machine constantly showering forth a stream of sovereigns to enrich the coffers of shareholders; it would show that an even larger flow has been distributed amongst the Government, the labouring community, merchants, and the country at large. Some people appear to imagine that the sole function of an industry is to earn money for employees and to assist the public purse by generous contributions to the Government revenue in the shape of various forms of taxes. There is, of course, another aspect, and a very important aspect, too—that of remuneration to shareholders. It is not, however, our purpose at this juncture to discuss the relative claims of capital and of labour but rather to state in definite figures the amounts of money that have been paid out by the mines to date.

The Leading Mines.

The Robinson, it will be noted, heads the list with a total disbursement of almost ten millions sterling. The Robinson has proved the most highly remunerative gold mine in the world in point of aggregate distribution, the Mount Morgan in Queensland being the only other mine which can at this date pretend to any rivalry for this distinction. The total of the Crown Mines is, however, gradually forging ahead, and it is only a matter of a few years and the total disbursements of the great Central Rand amalgamation will exceed the Robinson's total. Taking, however, the distribution per cent., the Ferreira (now merged in the Ferreira Deep) claims premier place. On its small capital of £95,000 (the final capital of the company) close on four millions sterling were paid out, or a total of no less than 4,465 per cent. The only other mine in so far as cash distributions as a result of actual crushing are concerned to approach the Ferreira's total is the Crown Reef, which paid out £2,867,900, or 2,404 per cent. on the capital involved. In other words, each pound originally invested in the Ferreira returned £44 13s. and in the Crown Reef slightly over £24. The Johannesburg Pioneer, a wonderfully rich little outcrop concern which has been defunct for some years and was absorbed by the Crown Reef paid out an aggregate from dividends of 2,107½ per cent. from mining and 1,500 per cent. from the sale of a portion of the original area owned so that the actual total from working and sale was 3,607½ per cent., or over £36 for each original pound invested. It is interesting to recall that this company's small area of 5¾ outcrop claims, situated between the Robinson and the Crown Reef Mines, having reached the stage of exhaustion as to contents of South Reef and Main Reef Leader, the company went into liquidation, the assets passing to the Crown Reef Gold Mining Company. The experience was that over 42,500 tons of South Reef and Main Reef Leader had been milled per claim in the history of this company, leaving the Main Reef untouched. From 241,215 tons milled the dividends paid equalled 37s. 1d. per ton. The total yield was £917,887, or 76s. 1d. per ton. The capital was £21,000 and the company was formed in October, 1886.

The List in Full.

Our list includes, in addition to the Ferreira, the Crown Reef, and the Pioneer, a number of other mines which established remarkable dividend records but which are now either defunct or have been absorbed by adjacent mines—prominent amongst these being the Bonanza, Geldenhuis Estate, Henry Nourse, Robinson Central Deep, Driefontein and Angelo. In regard to existing mines and amalgamations of companies, it should be noted that the total of the East Rand Proprietary Company's dividends are those declared since amalgamation. The list is as under:—

	Capital.	Total Dividends.	Total per cent.
Robinson	£2,750,000	£9,794,688	356½
Crown Mines	517,058	6,829,011	1,177½
Simmer and Jack ...	3,000,000	4,791,461	310
Ferreira	95,000	3,966,750	4,465
East Rand Proprietary	2,445,897	3,899,723	165
Ferreira Deep	980,000	3,627,750	395
Robinson Deep	1,000,000	3,375,186	357½
Village Main Reef ...	472,000	3,077,143	695
Crown Reef	120,000	2,867,900	2,404
Langlaagte Estate ...	886,500	2,862,239	519
City and Suburban ...	1,360,000	2,567,913	421¼
New Primrose	325,000	2,453,775	847½
Rose Deep	700,000	2,403,125	452½
Geldenhuis Deep ...	585,783	2,028,424	587½
Witwatersrand	469,625	1,755,624	202½
Witwatersrand Deep...	550,000	1,715,093	325
Van Ryn	500,000	1,694,500	352½
New Modderfontein ...	1,400,000	1,667,500	125
Geldenhuis Estate ...	200.000	1,640,750	835
May Consolidated ...	288,750	1,485,724	517½
Robinson Central Dp.	440,000	1,485,000	337½
Nourse Mines	827,821	1,380,879	202½
Durban Roodepoort ...	125,000	1,378,823	1,120
Knights Deep	643,526	1,367,493	200
New Kleinfontein ...	970,000	1,347,375	175
Bonanza	200,000	1,325,000	662½
Meyer and Charlton ...	200,000	1,265,308	1,160
Angelo	625,000	1,231,648	333¾
New Heriot	115,000	1,132,537	1,027½
Village Deep	1,060,671	768,988	72½
Driefontein Cons. ...	625,000	741,111	195
Henry Nourse	125,000	737,500	590
Wolhuter	860,000	647,250	83¾
Jumpers	100,000	586,525	625
Ginsberg	210,000	582,375	312½
Cons. Main Reef ...	921,364	507,653	52½
Randfontein South ...	2,000,000	500,000	25
Johannesburg Pioneer	21,000	442,575	2,107½

"The Jumpers" G.M. Co.

The following is the report on operations at "The Jumpers" during the quarter ended 30th April: Ore mined, 24,840 tons; ore sorted (underground and at surface), 33·3 per cent., 8,280 tons; ore taken from surface dumps, 100 tons; ore milled during quarter, 16,660 tons; yield per ton milled, 39s. 2·31d.; working costs per ton milled, 37s. 1·43d.; working profit per ton milled (£1,727), 2s. 0·88d. 8,851 tons of accumulated slimes and sands were treated during the quarter. The yield was 11s. 3·14d per ton treated, while treatment costs amounted to 4s. 11.63d., thus leaving a profit of 6s. 3.51d., or £2,784 17s. 6d. Profit from mine, £1,727; profit from accumulated slimes, £2,784 17s. 6d.; total profit for quarter, £4,511 17s. 6d., which has been dealt with as follows: Handed over to the Treasury Gold Mines, Ltd., in settlement of their share of the profit, £1,621 15s. 6d.; set aside in terms of agreement with Treasury Gold Mines, Ltd., £832 1s. 5d.; appropriated by this company, £2,058 0s. 7d. Cash position at 30th April, after providing for all liabilities, £1,362 7s. 10d.; cash assets, viz., stores and materials sundry debtors, payments in advance, etc., but exclusive of share investments, £4,131 15s.; loan on mortgage to the Benoni Consolidated Gold Mines, Ltd. (exclusive of interest from the 1st April, 1912), £8,333 6s. 8d; total, £13,827 9s. 6d

SINKING OPERATIONS AT SPRINGS MINES.

Working in Water-Bearing Strata—The Routine of Blasting.

Two shafts, now being sunk at the Springs Mines, in the Transvaal, present some new features in sinking through water-bearing strata, so far as experience on the Rand is concerned. Each shaft is of seven compartments. Six of the compartments are 6 ft. 6 in. by 5 ft., inside timbers, and the seventh, or pump compartment, is 6 ft. 6 in. by 6 ft. The excavation measures approximately 42 x 9 ft.

The sinking conditions covered here may be divided into two periods: (1) The period from the date water was struck in the dolomite, of the Black Reef series, to the time the pump chamber was started in the Witwatersrand quartzites; (2) the period from the installation of the pump station to the time the permanent electric pumps were started. As the two shafts are equipped in the same manner, and the conditions vary merely as to the quantity of water dealt with per day, only the north shaft, in which the maximum amount of water is met with, need be referred to in detail.

Equipment for First Sinking Period.

The equipment for the first period consisted of: A wooden headframe, 65 ft. high, erected over compartments Nos. 2, 3, 4, 5 and 6; two 16 x 30-in. double-drum geared hoists for compartments Nos. 2 and 3, and 5 and 6, four 600-gal. tanks with 24-ft. shoes for bailing below timbers; one single-drum winch for handling rock from the bottom through No. 4 compartment; two horizontal low-lift Worthington pumps, 10-in. suction, 8-in. delivery, 7½ x 10¼ x 10 inches.

The plan of the shaft, with the equipment provided for this initial period, was, therefore, as shown. The Worthington pumps were carried on the bottom set of timbers in such a way that they could be lifted, lowered, or handled, as desired, entirely within their own compartments. They were further equipped with a patent pipe-joint on the suctions, whereby the suctions could be disconnected by merely raising a lever. The suctions were further connected by wire ropes to hand winches on the surface, in order that they could be raised when blasting was being carried on. The pumps were used solely for lifting the water from the shaft bottom and delivering it to a ring, whence it was bailed by the engines to the surface. As the pumps were overloaded all the time, the head was never allowed to exceed 30 ft.; and when this lift had been reached, a new ring was installed, the head reduced, and the bailing tanks lowered to the new level.

Water was struck at 460 ft. below the surface, and followed the shaft down along a fissure to a depth of 605 ft., at which point the Witwatersrand quartzite was entered. Altogether, six rings were put in at depths varying from 450 ft. to 619 ft., the deepest, which afterwards delivered the water to the permanent pump sump, being below the dolomite. All these rings were connected by down pipes to run any water caught up by them to the lowest or bailing ring.

The construction of the rings was as follows: A wooden bottom, 4 in. thick, was fitted carefully from the outer edges of the plates to the rock walls of the shaft between the blocks. Planks 3 x 9 in., planed and blanketed, were placed on edge around the shaft flush with the inner sides of the plates, and the space between the planks and the rock walls was filled in with concrete to the top of the planks. Similar planks were then built up on edge to the height of the next plate above, thus forming a tank all around the shaft about 5 ft. deep. The sides of the tank were then fitted with two 8-in. sluice valves to each compartment containing a bailer. Crushed ant heap was most successfully used for stopping any small leaks against the shaft wall.

Routine of Blasting.

Blasting was done with 24-ft. fuses, which were tied to the bottom set of timbers and lighted there. A man stood by each pump, and when the miners were ready to spit the fuses, signals were given, the pumps stopped, suction joint levers raised, and the signal to hoist suctions given. On the pumps stopping, the bailing ring gang went to the surface, and as soon as the suction started to move, the fuses were spit, and pump men and shaft men went to the surface in the sinking bucket.

No damage was ever done to the pumps by blasting, as the water over the holes prevented damage by rock, and the time was so short, between breaking suctions and blasting, that the water never quite reached the pump platforms. After blasting, the bottom set of timbers was examined, marks given to the hoisting engineers, and the two engines started bailing from the bottom until the bailing tanks no longer came up full. By this time, the pumps having been examined and tested, the drums were clutched in to serve the bailing ring and the remainder of the water got out. After blasting, it took about six hours to get the water out of the bottom, and so allow the shaft men to resume work.

In the table, the first seven months represent the work done during the first period. The quantities of water were estimated from the number of 600-gal. tanks pulled per hour while the shaft was being drilled. The shaft reached the bottom of the dolomite on January 12, 1911, at 605 ft., and work was started on the pump station at 650 ft.

Equipment for Second Sinking Period.

For the second period the equipment was changed and increased. The headframe was extended over No. 1 compartment; a double-drum, geared engine was installed to handle 1,000-gal. tanks through Nos. 1 and 2 compartments; and two 1,000-gal. tanks with 24-ft. shoes were added. A double drum winch was installed to hoist rock from the pump station through No. 7 compartment, and false dividers and guides were set in No. 7 compartment, to allow this winch to operate.

Summary of Sinking Operations.

	Gals. Water per Day.	Number Tanks. per hour per Engine.	Footage Sunk per Month.	Total Depth of Shaft.	Average Daily Water Flow Gallons.	Average Footage per Month.
Aug., 1910	1,656,000	57·5	21	459 480	2,000,230	27·3
Sept.	2,073,600	72·0	20	500		
Oct.	1,872,000	65·0	23	523		
Nov.	2,304,000	80·0	41	564		
Dec.	2,102,400	73·0	19	583		
Jan., 1911	2,073,600	72·0	32	615		
Feb.	1,920,000	66·6	35	650		
Mar.	1,881,600	—	38	688	1,726,571	70·3
April	1,814,400	—	46	734		
May	1,710,000	—	52	786		
June	1,710,000	—	54	840		
July	1,650,000	—	82	922		
Aug.	1,650,000	—	110	1032		
Sept.	1,650,000	—	110	1142		

This additional equipment was put into commission on March 2, 1911. The ropes of the old north engine were deflected to operate in Nos. 3 and 4 compartments, the single-drum sinking winch was discarded and the South engine equipped with sinking buckets. The object of the rearrangement was to relieve the tremendous strain on the bailing engines; to concentrate the water haulage at one end of the shaft and the rock haulage at the other end; and to release one engine exclusively for sinking, and provide another for use at the pump station.

Pump Chamber Cut.

The final ring below the fissure was put in at 619 ft., and all the water was bailed from this level. The actual pump-station level was 654 ft., or 35 ft. below the bottom ring. The pump-chamber portion of the station was completed by May 31, 1911, and a temporary centrifugal pump installed with its suction connected to the ring at 619 ft. This pump was driven electrically, had a capacity of 1,500,000 gal. per day under a head of 1,000 ft., and, being situated at 654 ft., 35 ft. below its sump, was actually working under a head of 619 ft. With an overload of 10 per cent., and the sixth stage of the pump replaced by a blank, the pump dealt with all the water comfortably, the quantity having, fortunately, decreased considerably after the shaft got below the fissure. This pump started on June 19, 1911, when the sump was scarcely begun, and, therefore, when the power went off, there was no storage for the water. This difficulty was got over by keeping the ring manned for bailing day and night, with the tanks stationed in front of the sluice valves, and it was found that bailing could be restarted in about three minutes. Occasionally, however, the ring ran over, extinguishing all the lights in the shaft bottom. This danger was relieved by installing a motor head-lamp connected with accumulators on the bottom set of timbers, thus insuring some light, at least, for the shaft men to get away by. When it is known that 70 natives and two white men constituted the shift in the bottom of the shaft, it speaks well for the efficiency of the system described that only once were the natives in any danger of drowning, and this occurred before the accumulator lamp was provided.

The whole station was completed, and the two permanent centrifugal pumps installed, by September 30, 1911. In the table, the last seven months represent the second period. The number of tanks hauled with each engine is not given, as the tanks were then of different sizes; but, on the average, about 45 of the 1,000-gal. tanks per hour were hoisted, the rest of the work being done by the 600-gal. tanks.

In conclusion, it might be of interest to mention that the permanent pumping plant was so satisfactory that no delay was caused in the shaft bottom on account of this water, and the only stoppage of the pumps was caused by the power supply being cut off. The average rate of progress in the shaft from September, 1911, to October, 1912, was 130 ft. per month. The reef was cut in the north shaft on March 25, at a depth of 3,432 ft. Development is now rapidly proceeding.

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*A paper contributed to the Institution of Mining and Metallurgy by Mr. B. D. Bushell, manager, Springs Mines.

SALTING OIL PROPERTIES.

Some Points for Seekers of Oil in South Africa—How Mistakes are Made.

The ordinary engineer is familiar with most of the means for salting the metalliferous mines. An interesting exposition of the methods used in salting oil prospects is given by Dorsey Hager in the *Fuel Oil Journal*, April, 1913. A method said to have been employed by Burr Brothers was as follows:—On one lease they had several fair producing wells, and more that produced little or nothing. To make a good showing for intending investors, they filled the small wells full of oil at night and started them pumping before the visiting investors were due. Pipe lines from a large storage tank were run to the casing at each well, and certain trusted employees filled the wells to the top. Fifteen to twenty minutes before the visitors were to arrive at the lease the wells were started and immediately put out a good stream of oil, which lasted from 45 minutes to an hour. Visitors were whisked from well to well and given no chance to return to the salted ones. By such methods thousands of dollars were obtained from investors who with their own eyes saw fine producers on the property. A similar method consists in circulating the oil that was pumped from the well directly into the well again. By this method the well will show a continuous production and makes a fine front to examining investors. A careful study of pipe lines will of course show this crooked method, but unless one is familiar with the scheme it will prove a sure deceiver. Another method is one in which the examining engineer does his own salting. A green engineer will hold a 5-gal. bucket at the mouth of the well and note the time required to fill it, but a number of important factors must be taken into account in figuring production by this method. Oil shrinks from 20 to 60 per cent. upon standing, due to the escape of inclosed gas. It is customary to allow the oil to settle 24 hr. and then measure the shrinkage; also to have an accurate gauge, a uniform pumping speed must be maintained. Water is also present in many cases, and sand as well. Where from 15 to 50 per cent. of water may occur, precaution must be taken to provide against mistakes in bucket-gauge testing. Of course the best method of obtaining production is to get reports of runs made to pipe-line companies and then check them up by extended tests at the wells, using both bucket and tank gauges. The only accurate gauge method is an actual tank test showing run over a period of a week or more, with the examiner or his representative on the ground at all hours. Wells vary greatly in their production from hour to hour, but a 24-hr. gauge will be fairly constant providing the pumping speed is held constant. Another crooked method keeping up production is by robbing pipe-line companies of oil. This is a risky business, but is done occasionally. The pipe line is tapped at some point and oil run from the line back into the holes or tanks of the dishonest company, where it is again bought by the pipe-line company. Prospect holes are sometimes salted by filling with oil and then bailing them out for prospective investors. Such a method is crude, but has been successful during boom times. Another crude salting method was once used on a spring where there was a thick scum of heavy oil on the surface of the water and more bubbling up from below. This district was one which from its geology should not have any oil in it, but the oil was there to confute all theories. The examining engineer in this case made a midnight trip to the spring and found no oil bubbling up. Getting down on his hands and knees, he poked around the bottom of the spring and finally found a small pipe which gave a clue to the mystery. There seemed but one place the oil could come from, and that was near the top of the small knoll close by. The engineer finally found a spot that showed signs of having been recently dug up, and uncovered a barrel containing crude petroleum. Occasionally samples of oil are switched on the examiner. Careful attention to samples will do away with such trickery. Also it is not unusual to deceive one's self as regards oil property. Thus in drilling for oil, some of the lubricant for the machinery has been known to leak into the drill hole, causing a temporary excitement, as the drillers would think the traces of oil presaged a good supply below and boomed the district on such showing. If oil has been found in quantity it nearly always shows strongly in the material dumped from the bailer, and a study of the sand pile will generally give a good clue as to whether or not oil has been found. However, the only true test lies in a careful examination and actual gauging of the well, and actual pumping tests will tell the tale, and no engineer should be content without making such a test.

Transvaal G M. Estates

The following are the particulars of this company's output for the month of June:—Central Mines: Tons crushed, 12,400, yielding 9,513·112 ozs. Elandsdrift Mine: Tons crushed, 700, yielding, 622·126 ozs. Vaalhoek Mine: Tons crushed, 1,150, yielding 514·830 ozs. Estimated value of month's output, £44,476; estimated profit for the month, £28,709.

POSITION OF THE TIN MARKET.

A Sharp Decline in Prices—Market in the Hands of "Professionals."

THE marked decline in current prices for tin, and in a lesser degree for copper, have been conspicuous features of dealings on the European and American metal market during the past week or two. South Africa is a producer of both metals and the effects of the decline have, in the case of tin at any rate, been felt in no insignificant degree by stockholders of Transvaal tin shares.

CAUSES AND EFFECTS.

Other influences have doubtless been at work in addition to the sharp fall in metal prices—minor fluctuations in development results in the mines themselves and the panic resulting from the great strike for instance. But the prime reason for decline in quoted prices of Transvaal tin shares has undoubtedly been the severe drop in the price of metals. At the time of writing the price for Straits Tin (a very fair barometer of the situation) on the London Metal Exchange, is quoted at £178 10s. per ton. Three weeks ago (on June 13th) prices were as follows:—

English ingots, f.o.b.	£212	0	0	...	£213	0	
English bars	213	0	0	...	214	0	
English refined	214	0	0	...	215	0	
Standard Cash	209	5	0	...	—		
Standard Three months ...	209	5	0	...	—		
Banka (in Holland) Cash ...	212	0	0	...	—		

In other words the price for the metal has fallen over £30 per ton in the last three weeks, equivalent to a drop of about 16 per cent. Now a decline of 16 per cent. in the selling value of product must have a very adverse effect on a medium grade or even moderately high grade mine. It means more than a 16 per cent. decline in the profitable potentiality of a mine, since such a drop may well render considerable tonnages of ore, which were payable with tin at £210 per ton or over, unpayable at present prices.

Setting aside then the questions of the effect on tin stocks brought about by mine developments and sympathy with general market weakness, it is not difficult to understand why Zaaiplaats, which in the middle of last month were quoted at 50s., have fallen away to 36s. 6d., why Rooibergs, during the same period, have declined from 38s. 6d. to 30s. 9d., and why Swazi Tins have dropped "three-eights," from 50s. to 42s. 6d.

AN AUTHORITATIVE VIEW.

The general impression is that the decline in the price of the metal has been brought about by market manipulation. "squeezing" and "cornering," rather than by any really important fluctuations in actual supply and demand. Writing from London in the middle of June, an authority on the Home Metal Markets dealt with the position in the following words: "During the early part of the week Standard tin was very freely offered on the market, and down to £204 was accepted. All positions practically sold at the same level, and the premium for the earlier positions entirely disappeared. The East sold repeatedly, but only moderate quantities. The lower level has brought out an improved demand from the trade, and is likely to further stimulate consumption, whilst the Standard market has already recovered and is now slightly above last week's close. The near future of tin is in the hands of the professionals, and the course of prices will be largely dictated by their policy." If this view be true, and the market is indeed in the hands of "professionals," then it is not unlikely that there may be a sharp and sustained recovery at an early date.

Generally speaking reports from the Transvaal and Swaziland Tin Fields are uniformly good, and with a rise in the price of metal a concurrent advance in the price of shares may reasonably be expected.

U.K. IMPORTS FOR THE YEAR.

Meanwhile it is interesting to note statistics of United Kingdom imports of tin ores for the first five months of 1913, and for the corresponding period of last year. These in regard to Africa are of special local importance, but as Africa has entered the arena of the world's tin industry the figures for the other countries are given as well. Statistics are:—

Country whence imported.	5 months 1913. Tons.	5 months 1913. £	5 months 1912. Tons.	5 months 1912. £
AFRICA—				
Cape of Good Hope	—	—	—	—
Natal	1	95	—	—
Nigeria	—	—	—	—
Portuguese East Africa	—	—	109	3,876
Southern Nigeria	342	45,824	606	54.446
Northern Nigeria	1,463	152,601	603	55,054
Transvaal	165	22,579	200	22.097
Swaziland	107	13,200	82	10,183
Rhodesia ...	—	—	—	—
AMERICA—				
Canada	38	1,591	—	—
United States	168	16,161	159	12,503
Mexico	—	—	—	—
Argentine Republic	52	5,888	139	8,390
Bolivia	8.096	803.435	6.367	567,979
Chile	1,496	128,395	1 683	119,572
Peru	49	4.643	230	22,401
Uruguay	4	325	—	—
ASIA—				
British India	31	4.000	9	450
Burmah	—	—	—	—
China	1	105	—	—
Straits Settlements	43	3.597	31	2.577
Hong Kong	31	2,794	—	—
Japan	53	5,880	—	—
AUSTRALASIA—				
South Australia	50	2.500		
West Australia	21	2.050	—	—
Tasmania	—	—	—	—
Victoria	—	—	—	—
New South Wales	56	1,691	—	—
New Zealand ..	—	—	1	151
EUROPE—				
Austria Hungary	—	—	—	3
Belgium	47	2.229	25	1.028
France	529	31.040	376	21.731
Germany	616	32.465	985	22.776
Italy	60	2 459	52	1.112
Netherlands	29	1.092	194	2.414
Portugal	90	6.159	12	793
Russia	40	1.882	8	2,582
Spain	270	13,673	90	3,297
Sweden	3	118	1	65
Switzerland	—	—	16	2,110
Totals	13.951	£1,308,471	12,019	£937,489

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Rhodesian Section.

LATEST MINING NEWS.

Two Dividends—The Gwelo District—The Jumbo—Cam and Motor's Position—Susanna Mines—Eldorado Banket—The Falcon Report—Shamva Developments—A New Rhodesian Company.

Dividends have just been declared by two Rhodesian mining companies—the Globe and Phoenix and the Bechuanaland Exploration Company. The former concern announces an interim dividend of 1s. 9d. per share. The Globe and Phoenix Company's capital is £200,000 in 5s. shares, all issued and fully paid, so that the distribution is of 35 per cent. and involves a sum of £70,000. The Bechuanaland Exploration Company earned a profit last year of £7,616 and now announces a distribution of 4 per cent., which, on the capital in issue of £200,000 involves the distribution of £8,000.

* * * *

The Gwelo correspondent of the *Bulawayo Chronicle* writes of mining in that district: It is pleasing to see the Lower Gwelo district opening up again, and to find mills working at most of the old points of call between Gwelo and the Gothic. The Rocksand and Sceptre are being worked by the R. W. Syndicate. Close by are the Gretna Green and the Alannah, and the Shamrock's ten stamps are now being worked by Messrs. Crampin and Masters. A rich strike is reported on the Allannah, on which claims a five-stamp mill is in course of erection by the A. and B. Syndicate. Developments on the Gretna Green, the property of Mr. M. L. Price, are proving a rich strike. Mr. Bellasis, ot the B.S.A. Co.'s staff of engineers, visited this property recently, and the assay value of samples taken by him at the 3rd level (140 ft.) are high. Sinking to the 4th level is now in progress and should the values continue at depth this property will take a leading place in this district. The owner was attracted to this section only by finding 3 dwts. in the rubble and outcrop, and encountered the reef after sinking and driving about 130 ft. The claims lie about a mile from the Shamrock, and adjoin the Allannah. Messrs. Holmes and Urquhart are prospecting upon the old Elysian, and intend erecting a five-stamp mill there shortly.

* * * *

Official summary of consulting engineer's report, dated Jumbo mine, May 8:—General: Underground they are in a better position as regards ore broken on account of the reduction of the tons treated, and as far as it is possible to see they should be able to keep the mill running fairly comfortably for the next three or four months. We have practically developed 2,800 tons more; this, with ore we ought to get from other parts of the property, should last three months at least. Development work can only travel slowly, and the results obtained so far have justified the work. We are hoping to discover new ground below the third level at No. 1 shaft, below "X" stope; but to open this area up will require at least three months. By going slowly we can do the work more economically, and the chance of missing anything is minimised. The plant and machinery are running satisfactorily. A great many changes have, unfortunately, been taking place throughout the property by heads of departments leaving for holidays or going in for other occupations, as farming and tributing, but our position today is much better than we expected it to be about six months ago.

* * * *

The following letter, signed by the Secretary in London of the Cam and Motor G.M. Co., appeared in the *Financial Times* of Tuesday in mail week:—"Sir,—With reference to the note on Cam and Motor in your mining market column dated Saturday last, May 31, I am instructed to say that the official figures of the reserves are based on a careful system of independent re-sampling, followed by a system of check sampling, which has always been carried out in order to obtain accuracy, and all calculations of tonnage and value have been made with more than the usual percentage of deduction for safety. The results of upwards of 3,000 tons taken from various parts of the mine and dumps treated through the experimental plant over a period of six months confirm the correctness of the sampling. The shareholders were informed in a circular letter dated April 17 last that development ceased on December 31, 1912, the ore reserves being then in such a satisfactory position that, beyond preparing the mine for stoping, work could be concentrated on erection of the plant. The last monthly development cable was, therefore, published on January 8, 1913. I am instructed to say that the progress of the erection of the plant is proceeding in a satisfactory manner."

* * * *

The latest report from the Susanna Mines says:—Winzes 10 to 11 S.S. south drive sunk to a depth of 8 ft.; at 5 ft. reef over 36 ins. assayed 51 dwts.; 11th level, Spur Reef, advanced to a distance of 61 ft.; at 60 ft. reef 48 ins. wide assays 179·5 dwts.; winzes 11 to 12 N.S. (north) sunk to a depth of 25 ft.; at 15 ft. reef 18 ins. wide assays 18 dwts.; at 20 ft. reef 39 ins. wide assays 40 dwts.

* * * *

The report of the Eldorado Banket Gold Mining Company, Limited, for the three months ended March 31 last shows that the total profit for the period was £30,343. The estimated balance of net profit, after deduction of the interim dividends, and subject to the customary allowances for depreciation on plant, buildings, etc., amounted at March 31 to approximately £75,000, including gold in reserve. Owing to the caving of the old stopes above the 6th level, and the unsatisfactory results of the trial crushing of the Parallel Reef on the 6th to 9th levels, which yielded 3·3 dwts. per ton, the board have resolved, on the advice of Mr. Piper, to reduce the milling grade to about 8·0 dwts. from July 1 next. This will reduce the profits to about £4,000 a month, and will be continued for a period of six months, at the expiration of which the policy will be reconsidered.

* * * *

The directors of the Falcon Mines, Limited, submit the following statement as to the progress of development on the company's properties during the three months ended 31st March, 1913:—During the period, the following footage was completed:—

	Driving.	Crosscuts.	Sinking.	Total.
Falcon	238	161	152	544
Iron Mine Hill	192	157	70	419
Total during period ...	423	318	222	963
Completed to 31st December, 1912	8,488	7,179	5,754	21,421
Total at 31st March ...	8,911	7,197	5,976	22,384

Ore Reserves.

	Oxidised Tons.	Value.
31st December, 1912	170,051	£264,000
Added during three months	8,571	28,046
Total at 31st March	178,622	£292,046

	Sulphides Tons.	Value
31st December, 1912 ...	635,732	£1,669 225
Added during three months	2,657	51,233
Total at 31st March	638,389	£1,720,458

	Total Tons.	Total Value.
31st December, 1912	805,783	£1,933,225
Added during three months	11,228	79,279
Total at 31st March	817,011	£2,012,504

* * * *

As the result of careful re-sampling of some sections of the mine, the consulting engineer has slightly increased the value of the sulphide reserves, and on the usual basis of copper at £56 per long ton, the average value of the sulphide's reserves on 31st March last was 53s. 11d. per ton, compared with 52s. 5d. per ton at 31st December last. On the basis of copper at its present price of about £66 per ton, 6s. should be added to these values. Owing to the large ore reserves now blocked out, further development has been practically stopped during the period under review, and underground work has been almost entirely confined to the opening of stope drives, ore passes, connections to the new main shaft and generally preparing the mine for production. The 6th level has been extended to a point 180 ft. east of No. 9 shaft, at which point a crossent exposed 40 ft. of ore with a value of 82s. per ton. The lowest point so far reached in the mine is in a winze from the 6th to 7th level, which at the date of the last advices had reached 19 ft., the only assay result reported being 23·6 dwts. of gold and 6·88 per cent. of copper (= £8 3s. 0d.) per ton across the full width of the winze, 54 in. Main shaft had reached a depth of 516 ft. on 31st March, and at the date of latest advices a further 115 ft. had been sunk. Iron Mine Hill: A resurvey and sampling of this property proves that the amount of ore already developed suitable for fluxes considerably exceeds the original estimate, and an ample supply being assured for many years, development work has now been suspended Good progress has been made during the quarter on the preparations for the erection of the reduction works—including the railway siding from Umvuma Station to the mine. Foundations have been practically completed, tenders for the plant accepted, and the consulting engineer anticipates that, subject to the delivery by various makers, the plant will be completed within ten months.

* * * *

From the directors' report for the quarter ended March 31 on the Shamva: Driven, risen, and sunk (excluding main adit, 4th level), 361 ft.; ore developed during period of report, 56,440 tons; ore in sight as at March 31, 2,319,752 tons. Working expenditure: Development account, £1,638; general expenses at mine and Bulawayo, £1,601. Main adit account, represented by an equivalent footage of 317 (single track), £1,374; capital expenditure, £19,039

* * * *

Unsweswe (Rhodesia) Gold Mines, Limited, was registered on June 2, with a capital of £15,000 in 10s. shares, to carry on the business indicated by the title. Minimum cash subscription, 100 shares. The number of directors is not to be less than two or more than five. The first are C. G. Temple and R. H. H. Eden. Qualification of the first directors, 25 shares; of subsequent directors, 250 shares. Remuneration, £100 per annum, divisible. Registered office: Bush Lane House, Cannon Street, E.C.

* * * *

At March 31 last, the date of the report submitted at the Golden Kopje Company's meeting on the 25th, the ore reserves were estimated to total 255,238 tons, with an average assay value of 7·3 dwts. In addition, there were partially developed on the Golden Kopje section 14,000 tons, of an average assay value of 6·5 dwts., and the Union Jack section 41,508 tons, of an average assay value of 13·61 dwts. This partially developed ore is now included in the reserves, "as in a mine of this lenticular formation it is extremely difficult to estimate developed ore in the ordinary method." The grand total of ore reserves may therefore be taken to be 310,746 tons, of an average assay value of 8 dwts. All development work ceased in July, 1912, on the Golden Kopje section, and in January, 1913, on the Union Jack section; but in order to prepare the mine for stoping the following work was authorised pending the erection of machinery and plant—namely, sinking the shaft to No. 4 level cutting station and opening out No. 2 level of the Union Jack section, which work is now in course of being carried out. Owing to arrangements which have been made for the purchase of the major portion of the Ayrshire plant, a considerable saving will be effected. All orders have been placed for additional plant required, and the erection and forwarding of the machinery and plant is only awaiting the conversion of the present gauge of the railway to rail-head, which work, it is hoped, may be completed by July next. The company has contracted a loan of £50,000 from the Gold Fields Rhodesian Development Company on satisfactory terms, which amount, with the present cash resources, should, it is estimated, be sufficient to bring the company to the producing stage. With a view to obviating the necessity and expense of laying a pipe-line to the Hunyani River, boreholes have been sunk, and the results warrant the hope that sufficient water will be obtained on the property to fully meet the requirements of the reduction plant now under order. The balance sheet shows that, including £7,550 sundry debtors, the company has cash resources amounting to £94,961, of which actual cash at bankers is £7,251.

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MINERAL DEPOSITS OF BROKEN HILL, NORTHERN RHODESIA.

A Description of the Geological Conditions—Specimens of Great Interest.

We have received from the South African Association for the Advancement of Science a copy of a paper entitled " A Mineral Survey of the Zinc and Lead Deposits of Broken Hill, Northern Rhodesia," by Arthur E. V. Zealley, A.R.C.S., F.G.S. In the course of this paper Mr. Zealley writes:—To the mineralogist there can be very few localities in the world of such interest as Broken Hill in Northern Rhodesia. The minerals occurring there in the deposits of zinc, lead and vanadium have attracted considerable attention in spite of the inaccessibility of the locality, which is some 300 miles north of the Zambesi. The variety and the extreme beauty, together with the rarity of several of the minerals occurring in the deposit, render its study immensely attractive, and the unique association of mineralized bones, the implements and other evidences of human occupation of the caves in the deposit further increase the interest of the subject. The deposits have been opened up for mining. The examination of the minerals *in situ* and survey of their distribution bring out several points of interest regarding their origin. The mining operations carried out by the Rhodesia Broken Hill Development Co. enabled the writer to make during a visit to the mine extending over some ten days a somewhat hasty but detailed survey of the deposits, and he has thought that it may be of interest to publish the results.

Geology of the Deposits.

The country in which the deposits are situated is fairly flat except for a series of small kopjes (named Nos. 1, 2, 3, 4) and one or two others. These kopjes consist, in some instances entirely, and in others in large part, of the oxidised compounds of zinc and lead and iron. The mining development work carried out consists chiefly of a series of adits mostly driven right through the kopjes in several directions and at several levels; from these are put out a number of cross-cuts. A few rises between the levels and several small winzes exist, also, several shafts are sunk from the surface of the kopjes and between them; in the kopjes several large quarries and benches have been made. In Kopje No. 1 an incline passes down to water-level, where a drive exists, and from the drive which extends from end to end of the kopje two cross-cuts are made; one of these opens into the lower part of the bone cave. Nearly all the workings, therefore, are in the oxidized zone, which has thereby been particularly well exposed. In making a traverse from south to north the following rocks are observed:—(a) Limestone; (b) phyllite (disturbed and contorted in places), passing insensibly to (c) limestone (largely dolomitic); (d) conglomerate; (e) ?phyllitic grit. The rocks are members of an ancient schistose sedimentary group, perhaps of the same general age as those occurring in Matabeleland, but probably considerably younger. No. 1 Kopje is situated on the limestone (c), and near it are the smaller kopjes 3, 4, etc. No. 2 Kopje is situated alone about half a mile S.S.E. of No. 1, partly in the limestone (a) and partly in the phyllite (b).

The Deposits.

The distribution and association of the minerals are of particular interest. Taking Kopje No. 1 as being the clearest example and best exposed, the distribution may be diagrammatically represented as follows:—

Zone 1.—The sulphide zone (occurring below water-level). This consists of a hard crystalline limestone, fine-grained, dolomitic and quartzose, usually considerably jointed, prevalently grey in colour, and containing scattered patches, particles and small veins of zinc blende, galena and a little pyrite. The water-level is very near the surface—some 17 feet below the general level of the surrounding country.

Zone 2.—The gossan or oxidized ore. A highly ferruginized and silicified limestone, rotted and cavernous and very strongly impregnated with carbonate of lead (and to a lesser extent carbonate of zinc), silicate of zinc, and the other oxidized zinc and lead minerals. This zone extends from the water-level to the top of the kopje, which is about 50 feet high. Small patches of unaltered crystalline limestone remain in this pale brown rock. This zone (2) comprises at its base—

Zone 2a.—The phosphate-vanadate zone, which occupies the lower part of the oxidized portion, and consists of carbonates and silicates, etc., mixed with phosphates and vanadates. It is an irregular zone, in which the phosphates and vanadates are locally much more abundant than the other oxidized minerals. Presumably the pre-existent carbonates of zinc and lead have reacted with phosphoric acid supplied by the extensive deposits of animal remains situated in this zone to produce the phosphates of zinc and lead. The cave, which is situated in this zone, contains a considerable thickness of mineralized bone-breccia. Other accumulations of bone-breccia have been discovered in various parts of this zone. The upper part of zone 2 consists mainly of carbonate of lead, silicate of zinc, oxide of iron, and carbonate of zinc. No phosphates or vanadates are present. The zones are fairly well marked, but a small amount of galena was noted in the oxidized zone, and even on the surface of the kopje. In one instance a very small amount of pyromorphite was found on the surface of the kopje at its summit.

Mode of Occurrence of the Minerals.

The details of the occurrence of the minerals are given briefly hereunder:—Galena and blende occur mainly below the water-level, where exploited in kopje No. 1, in small but frequent disseminations and veinlets in the limestone. These veins are generally not more than an inch or so wide. No sulphide minerals have been exposed in kopje No. 2, where work has been confined to the zone above the water-level. Occasional small patches of partly oxidized galena and blende are seen in the gossan of No. 1 kopje, whilst galena is even to be found at the surface of the kopje. Galena associated with cerussite was noted in the bone cave in one of the walls from which the covering of the hopeite and vanadinite had been broken away. The same mineral was found by Mr. White in the cave earth in the form of small lumps. Pyrite and chalcopyrite occur in very small quantities with the blende and galena in the crystalline limestone below water-level. Cerussite is probably the commonest mineral in kopje No. 1, but it was not found in kopje No. 2. A little is present in kopje No. 3. The mineral occurs in magnificent crystal aggregates encrusting the numerous cavities in kopje No. 1. These cavities are sometimes several feet in diameter, and often contain nothing but cerussite. The mineral is present intimately mixed with hemimorphite, iron oxide, quartz, etc., in the pale brown and whitish rock which forms the larger part of the gossan right at the surface. Sometimes the mineral is stalactitic, as was observed by Mr. Spencer. Calamine (zinc carbonate) is present in very large mammillated masses in the phyllite and limestone of No. 2 kopje, apparently being associated there with no other zinc or lead minerals. It also occurs rather commonly encrusting the cavernous surfaces of kopjes 1 and 2, and occasionally associated with cerussite and hemimorphite in the crystal-lined cavities in kopje No. 1. Hydrozincite is beautifully developed in mammillated and rosetted crusts infilling cavities and seams in kopje No. 2. It is not uncommon on the exposed surfaces of kopjes 1 and 2 as an amorphous crust. The hemispherical soft, white and earthy masses believed by Mr. Spencer to be hydrozincite, were

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found in several instances to be well developed in kopje No. 2. Hemimorphite (zinc silicate) is largely present in kopje No. 1, forming thick, partly crystallized and somewhat stalactitic crusts in cavities, some of which are large and completely lined with that mineral. Sometimes it is well crystallized. Often it is associated with cerussite or calamine and cerussite. Sky-blue hemimorphite occurs infilling smaller cavities. Perhaps the chief development of this mineral is that which forms an intimately intermixed aggregate with cerussite, quartz and iron oxide, and constituting the bulk of the gossan of Nos. 1 and 3. It also lines cavities in No. 3. A little doubtful hemimorphite occurs in cavities lined with other minerals in kopje No. 1, and it is "present in crystallized crusts on the bones and on the bone-breccia in the cave." Pyromorphite mostly occurs with tarbuttite in kopje No. 2 in the extremely beautiful crystal-lined cavities. Like the tarbuttite, it is deposited on spongy limonite. Exceptionally beautiful bright-green crystals in loose aggregates are seen lining cavities in kopje No. 2. These sometimes have no associated tarbuttite, and almost continuously line cavities several feet in diameter, thickly covering parts of the cavity. A little pyromorphite was found at the surface of kopje No. 1, and some occurs in a drive near the bone cave. Amorphous pyromorphite in curious very pale brown growths of small size was noted in small cavities in kopje No. 2. Hopeite was only noted in kopje No. 1, where in the bone cave it forms beautiful crystallized coatings more or less completely lining the cave as it existed when broken into. The thick mud and bone-breccia of the floor has plainly at some time subsided in part, so that at present the roof and floor of the lower cavity are composed of bone-breccia; this is thickly covered with vanadinite and hopeite resting directly on a very thin, minutely crystalline crust of ?tarbuttite and ?hemimorphite. The corroded form of hopeite occurs as a thick encrustation on one wall of the cave. In three other places in kopje No. 1 a little hopeite has been found either with or close by mineralized bones (in one occurrence the mineral was only doubtfully determined, and in one other the mineral has been removed). Parahopeite is so far the rarest of the zinc phosphates at Broken Hill. It occurs in small rosettes in the highest part of the bone cave, and perhaps to a very small extent in a drive in kopje No. 2. In the Rhodesia Museum is a specimen of coarsely crystallised parahopeite in limonite. It is believed to have come from kopje No. 2. Tarbuttite is chiefly developed in kopje No. 2, occurring in magnificent crystal coatings of considerable extent and various thicknesses in the numerous cavernous spaces of the dark-brown cellular limonite which occurs in the central part of the kopje. In most instances it is associated with pyromorphite. A little tarbuttite was noted crystallized upon descloizite in kopje No. 1 and in kopje No. 3; a small development is also recorded from the cave, from whence it was detected by Mr. Spencer as "very thin and minutely crystallized crusts on the hopeite specimens and on some of the bones. Tarbuttite was not noted in association with the fresh unaltered limestone. ?Goslarite—a white, powdery mineral associated with blende, and encrusting that mineral and small patches of a wall of a lower drive in kopje No. 1, is believed to be zinc sulphate, but unfortunately the sample was lost in transmission. Descloizite is present in kopje No. 3, occurring there in rather large aggregates of crystals, thin seams and crusts lining or infilling small fissures in the limestone and in small cavities 6 to 8 inches across, filled with coarsely crystallized descloizite on a surface of massive descloizite. It is associated with a little tarbuttite, etc. The mineral occurs as thin encrustations on portions of the surface of kopje No. 1 associated with calamine, and close by an accumulation of mineralized bones. On certain joint surfaces of the limestones containing calamine and in ferruginized ?limestones of kopje No. 2 small groups and isolated crystals of descloizite were found to be rather common. Vanadinite forms coralloidal growths and encrustations on the surfaces of the bone-breccia of the cave in kopje No. 1. It is intimately associated with hopeite, and is generally overgrown by that mineral. Limonite is exceedingly common in kopje No. 2, being the substance of the cavities in which the beautiful pyromorphite and tarbuttite occur. It is very cavernous and pseudostalactitic. The mineral as yellow ochre is also common intermixed with hemimorphite, cerussite, etc., in the gossan of kopjes 1 and 3. Massive limonite was noted in some of the drives of No. 2 kopje. A little Göethite is also present. Quartz, as implanted crystals lining small cavities in the gossan of kopjes 3 and 1, occurs abundantly. To a lesser extent it is similarly present in kopje No. 1. Chalcedony is less common than quartz, but large masses are present in kopjes 3 and 1. Psilomelane, in the form of wad, is present in kopje No. 2 in small amount. Malachite was found in very small amount in kopjes 1 and 2. ?Azurite also was found in very small amount, partly coating galena altering to cerussite. Chrysocolla also was noted in kopje No. 1, together with a little ?dioptase, which may, however, have been confused by the writer with ?copper phosphate, the pale-green mineral noted by Mr. Spencer as occurring in small bright-green (monoclinic?) crystals, and suggested by that author to be a copper phosphate. This mineral was noted in very small quantity in cavities in the surface ore of kopje No. 1. Dolomite is believed to be present in coarse aggregates in kopjes Nos. 1 and 2, but it was not found *in situ* by the writer. A white, pearly-lustred mineral in minute squat crystals present in kopje No. 2 is believed to be a phosphate of zinc, but it is not yet identified. The form of the crystals does not seem to conform with any of those of previously described zinc phosphates. No silicates of lead were detected, neither was greenockite found. These minerals were carefully searched for. Willemite is suspected, but could not be found by the author. Melaconite is suspected to be present in small quantity. It is stated that traces of gold and silver have been detected by assay of material from kopje No. 1.

Zaaiplaats Tin Mining Co

Results for the month of June, 1913, are as follows:—Days run, 27.1 days; ore milled, 3,040 short tons; residues retreated, 1,437 short tons; concentrates won, 113 long tons; average value of concentrates, 70.5 per cent. metallic tin; estimated profit for the month, excluding Government tax on profits, £9,357 2s. 5d.; deduct adjustments in respect of estimated value of previous shipments, £138 6s. 11d.; profit declared for the month, £9,218 15s. 6d. There was no capital expenditure.

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THE JUNE OUTPUT: GROUP RETURNS.

Central Mining Profits, £498,645—Further Improvement in Barnato Group.

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of June:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	67,750	16/ 0	21,281	£34,634
Geldenhuis Deep	300	7	56,500	23/ 3	19,594	16,473
Nourse Mines ...	260	7	49,900	21/ 9	18,059	21,430
Ferreira Deep ...	250	7	55,790	19/ 4	28,459	65,304
Crown Mines ...	660	26	186,500	16/ 9	67,228	126,053
Durban Rood. D	100	3	26,800	23/ 0	9,251	7,940
Totals & averages	1870	57	443,240	18/ 9	163,872	£271,834

The following are the results of crushing operations of Central Mining companies for the month of June:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	35,210	15/ 9	16,937	£43,433
New Modder ...	180	7	41,350	21/ 6	20,635	42,240
City Deep ...	150	9	37,900	27/ 2	17,138	20,187
Village Deep ...	180	7	46,500	20/ 7	17,460	25,367
Village Main ...	220	6	35,300	19/ 0	15,388	30,734
Robinson	250	6	59,800	13/ 9	24,124	59,934
Bantjes	100	3	29,700	21/ 0	8,655	4,916
Totals & averages	1160	43	285,760	19/ 5	120,337	£226,811

Barnato Group.

The following are the result of operations on the crushing mines of the Barnato group for the month of June:—

COMPANY	STAMPS.	TONS.	REVENUE.	PROFIT.
Consolidated Langlaagte .	100	49,300	£63,189	£23,207
Ginsberg	80	15,090	21,523	7,068
Glencairn	160	20,968	15,879	2,789
New Primrose	160	25,200	35,634	19,077
New Rietfontein	120	15,740	17,278	2,820
New Unified	60	12,380	15,698	5,149
Quest	35	4,153	3,147	154
Witwatersrand	220	37,510	49,357	24,105
June totals	935	180,341	£221,705	£84,369
May totals	935	185,740	£227,594	£81,949

Monthly gross profits for year 1913:—January, £79,198; February, £74,114; March, £81,152; April, £82,350; May, £81,949; June, £84,369.

Goerz Group.

The following are the results of operations of the crushing mines comprising the Goerz group for the month of June:—

Company	No. of Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	15,530	£13,875	£4,097
Princess Estate	60	5	21,200	27,449	2,278
Geduld	50	2	14,450	19,098	2,584
	210	7	51,180	£60,422	£8,959

The monthly profits for 1913 are:—January, £15,417; February, £10,317; March, £8,554; April, £8,860; May, £9,100; June, £8,959.

The Albu Group.

The June operations of the producing mines of this group were as follows:—

Company.	Stamps.	Tons Crushed	Total Cost.
Aurora West	80	14,320	£13,096
Cinderella Consolidated ...	45	8,250	13,026
Meyer and Charlton	75	14,635	12,354
New Goch	120	26,950	21,256
Roodepoort United	50	25,713	21,671
Van Ryn	140	24,710	23,439
West Rand Consolidated ...	100	30,500	32,431
	610	145,078	£137,273

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	18/ 3·5	£19,165	£6,070
Cinderella Consolidated ...	31/ 6·9	14,375	*1,349
Meyer and Charlton	16/10·6	33,988	21,634
New Goch	15/ 9·3	26,700	5,444
Roodepoort United	16/10·3	25,686	4,015
Van Ryn	18/11·7	39,495	16,055
West Rand Consolidated ...	21/ 3·2	42,928	10,497
		£202,337	£65,064

* Estimated.

Cinderella Consolidated.—The mill was closed down on the 25th June, and a circular has been issued to shareholders announcing this fact.

Van Ryn.—Operations were affected by the strike which broke out on the 19th June.

The profits for the first six months of the year are:—January, £66,262; February, £58,056; March, £63,830; April, £64,776; May, £74,906; June, £65,064.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	46,700	£68,695	£30,163
Wolhuter	29,400	37,213	10,328
Consolidated Main Reef...	22,443	34,346	10,973
Main Reef West	19,295	29,177	6,775
Knight Central	25,150	28,885	3,957
Total for group			£62,196

The monthly profits for 1913 are:—January, £53,085; February, £46,112; March, £51,917; April, £56,827; May, £57,056; June, £62,196.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for last month of the undermentioned companies of the Consolidated Gold Fields group:

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit
Simmer and Jack ...	320	7	72,700	17,277	£34,019
Robinson Deep	200	10	58,600	18,986	34,528
Knights Deep	400	11	100,800	17,773	*20,046
Simmer Deep	180	9	61,100	11,595	5,148
Jupiter	120	6	39,100	9,480	3,642
Sub Nigel	20	1	4,780	2,118	2,447
Totals	1240	41	337,080	77,229	£99,830

The "total profit" shown above includes sundry revenue, viz.: Simmer and Jack, £2,500; Robinson Deep, £510; Knights Deep, £682; Simmer Deep, £849; Jupiter, £476; Sub Nigel, £393; total, £5,410.

†The reduced tonnage for Knights Deep as compared with May was due to a breakdown of the crusher station.

*Knights Deep.—Of the total profit, £2,605 must be deducted in terms of circular to shareholders, dated 26th September, 1912.

Reserve Gold.—Simmer and Jack, 1,750 fine ozs.; Robinson Deep, 1,571 fine ozs.; Simmer Deep, 1,250 fine ozs.: Jupiter, 850 fine ozs.; Sub Nigel, 600 fine ozs.; total, 6,021

Robinson Group.

The following are the results of operations at the Robinson group of mines for June:—

	Tons Milled.	Total Fine Ozs.	Estimated Profit.
Langlaagte Estate ...	52,556	13,849	£11,811
Randfontein Central ...	229,285	66,308	83,480
	281,811	80,157	£98,291

Langlaagte Estate: Estimated profit per ton milled, 5s. 7·65d. Randfontein Central: Estimated profit per ton milled, 7s. 3·40d.

New Heriot.

The New Heriot Company's output returns for last month are are follows:—Ore milled, 12,800 tons; gold recovered, 5,269 ozs.; profit, £9,000.

Nigel G.M. Co.

Operations at the Nigel Mine for last month were as follows:—75 stamps crushed 13,000 tons of ore; 4,658 ozs. of fine gold was recovered, value £19,786; and the profit made was £4,150.

Sheba and Rosetta.

The following are the results of the working of the Sheba and Rosetta Mines for the month of June:—Sheba: Crushed 6,550 tons, yielding 3,165 ozs. of fine gold; estimated profit, £4,418. Rosetta: Crushed 897 tons, yielding 186 ozs. fine gold.

Luipaardsvlei Estate.

The following are the results of operations for June at the Luipaardsvlei Estate and G.M. Co., Ltd.:—60 stamps ran 28·876 days, crushing 17,450 tons, yielding 1,978 ozs. fine gold; 3 tube mills ran 29·151 days, yielding 852 ozs. fine gold; sands treated, 12,240 tons, yielding 1,308 ozs. fine gold; slimes treated, 5,210 tons, yielding 483 ozs. fine gold. Profit from operations, £3,342; sundry revenue, £1,241; total profit, £4,583; working costs, 18s. 4·732d. per ton.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of June, 1913:—Tons crushed, 3,666, yielding 1,894 fine ozs.; estimated value of month's output, £7,960; estimated profit for the month, £3,552.

Brakpan Mines.

The following are details in respect to the June, 1913, output:—Stamps working, 160; running time, 24 days; ore crushed, 53,000 tons; tube mills working, 8; ore hoisted, 57,625 tons; ore from dump, 1,940 tons; Waste sorted, 12.53 per cent.; fine glold declared, 18,042 ozs.; value declared, £75,950 (equal to 28s. 8d. per ton milled); working costs, £49,061 (equal to 18s. 6d. per ton milled); working profit, £26,889 (equal to 10s. 2d. per ton milled).

LAST YEAR WITH THE VILLAGE MAIN REEF.

Points from the Annual Reports—The "Life" Question.

The report of the Village Main Reef Gold Mining Company, Ltd., for the year ended 31st December last, presented to the meeting on 26th June, states that the capital remains at £472,000. The realised net profit from the year's operations amounts to £443,176, to which must be added the amount brought forward from the preceding year, £264,461, making a balance at credit of appropriation account of £707,649. Dividends Nos. 23 and 24 of 7s. each, free of income tax, declared on 12th June, 1912, and 11th December, 1912, respectively, have been paid, leaving a balance of £377,249 to be carried forward. The directors recommend that an interim dividend at the rate of 7s. per share, free of income tax, be declared payable to all shareholders registered on 30th June, 1913, and to the holders of coupon No. 24 attached to the share warrants to bearer. The total dividends paid by the company to date amount to £2,911,913. During the year the company has increased its holding in the Village Deep, Ltd., by purchasing 17,352 shares, bringing the total holding on 31st December, 1912, to 87,352 shares. Legislation has taken place in South Africa for the compulsory insurance of white and coloured underground workers who contract phthisis while in the employ of the mining companies. A compensation fund and an insurance fund are provided for, and the companies are assessed according to the number of their employees. The consulting engineer, Mr. Henry Stuart Martin, in his report, gives figures which show that for 1911 the tonnage milled was 476,250, compared with 470,056 in the year under review; working profit declared, including profit from accumulations, £467,289, compared with £501,126; development footage, 5,233, compared with 1,934; payable ore reserves, 1,418,754 tons, compared with 1,683,066 tons; value, dwts., 8·85 (37s. 2d.), compared with 8 (33s. 7d.). The slight reduction in tonnage milled during the past year is due to the shortage of native labour experienced during the early part of the period. The development of the mine is nearly completed, and the number of stope faces is steadily decreasing. In consequence of this, reclamation work has been vigorously carried on throughout the year by mining reef pillars left for supports in the old workings of the upper levels. The tonnage from the old workings has proved of good value, and has very materially helped not only to maintain but to increase the year's working profits, which were the largest earned in the history of the company. The work done in sand-filling during 1911 in support of the area in the neighbourhood of the main vertical and incline shafts has been well justified. The area in question has settled satisfactorily, no interruptions or inconvenience have been caused by crush, and at the same time it has been rendered possible to mine valuable pillars at a good profit which otherwise could not have been removed at this stage. All capital expenditure has been closed, and in future the working costs will bear all charges. The prospects for the current year are encouraging; an ample supply of labour is available, and it is estimated that the present high profits can be maintained during this year at least. The life of the mine, based on the present ore reserves, and covering the small area yet to be opened up, is nearly four years. A reduction in profits during the last three years must naturally follow.

JUNE OUTPUT IN DETAIL.

An All Round Decrease—The Labour Supply—Outside Districts also Show Falling Off.

The following are the salient figures of the June Output:—

Total output	747,077 ozs.
Value	£3,173,382
Decrease	47,229 ozs.
Value	£200,616
Rand Output	716,267 ozs.
Value	£3,042,509
Decrease	4,082 ozs.
Value	£191,495
Outside districts	30,810 ozs.
Value	£130,873
Decrease	2,147 ozs.
Value	£9,121
Rand stamps	9,370
Decrease	192

The following returns have been filed with the Chamber of Mines:—

The Witwatersrand.

	May. £	June. £	Inc. £	Dec. £
Aurora West	19,531	19,140	—	391
Bantjes Consolidated	39,687	36,764	—	2,923
Brakpan Mines	80,754	76,637	—	4,117
Cinderella Consolidated	18,962	14,107	—	4,855
City Deep	82,695	72,798	—	9,897
City and Suburban	52,489	50,387	—	2,102
Consolidated Langlaagte	66,031	63,189	—	2,842
Consolidated Main Reef	36,225	34,725	—	1,500
Crown Mines	286,433	285,566	—	867
Durban Roodepoort Deep	40,748	39,296	—	1,452
Durban Roodepoort	15,423	15,016	—	407
East Rand Proprietary Mines	258,419	254,643	—	3,776
Ferreira Deep	126,213	120,886	—	5,327
Geduld Proprietary Mines	18,783	19,145	362	
Geldenhuis Deep	88,807	83,230	—	5,577
Ginsberg	21,018	21,523	505	—
Glencairn Main Reef	16,430	15,878	—	552
Jupiter	44,363	40,268	—	4,095
Jumpers	11,532	9,859	—	1,673
Knights Deep	81,191	75,495	—	5,696
Knight Central	27,895	29,225	1,333	—
Lancaster West	—	25	25	—
Langlaagte Estate	60,628	58,827	—	1,801
Luipaardsvlei Estate	18,992	19,629	637	—
May Consolidated	14,183	13,907	—	276
Main Reef West	31,272	29,513	—	1,759
Meyer and Charlton	33,672	34,016	344	—
Modderfontein B	69,927	71,944	5,017	—
New Goch	27,290	26,761	—	509
New Modderfontein	98,747	87,652	—	11,095
New Primrose	36,437	35,634	—	803
New Rietfontein	17,250	17,276	26	—
New Unified	16,048	15,700	—	348
Nourse Mines	81,115	76,710	—	4,405
New Heriot	22,165	22,381	216	—
Princess Estate	28,927	27,517	—	1,410
Robinson	107,259	102,472	—	4,787
Robinson Deep	84,993	80,647	—	4,346
Rose Deep	93,293	90,396	—	2,897
Randfontein Central	292,108	281,658	—	10,450
Roodepoort United Main Reef	26,939	25,682	—	1,257
Simmer and Jack Proprietary Mines	73,783	77,211	3,428	—
Simmer Deep	52,217	49,252	—	2,965
Spes Bona Tribute	6,499	5,921	—	578
Van Ryn Estate	55,807	38,841	—	16,966
Village Deep	77,389	74,165	—	3,224
Village Main Reef	65,525	65,364	—	161
Vogelstruis Estate	15,903	15,105	—	798
West Rand Central	3,381	3,504	123	—
West Rand Consolidated	47,375	42,979	—	4,396
Witwatersrand	51,113	49,359	—	1,754
Witwatersrand Deep	68,002	69,336	1,334	—
Wolhuter	37,941	37,694	—	247
Miscellaneous producers	17,026	17,651	625	—
Outside Districts.				
Barrett	905	939	34	—
Transvaal Gold Mining Estates	43,773	45,960	2,187	—
Sheba (Rosetta)	1,716	956	—	760
Worcester Exploration	5,760	5,603	—	157
Nigel	20,003	19,786	—	217
Sub Nigel	10,093	8,997	—	1,096
Quest	3,262	3,148	—	114
Ceylon Lydenburg	1,121	837	—	284
Glynn's Lydenburg	6,652	8,045	1,393	—
Sheba	13,771	13,444	—	327
Miscellaneous producers	32,938	23,158	—	9,780

LABOUR POSITION.

The following labour figures for June are compiled and furnished by the Chamber of Mines:—Number of natives employed at the last day of the month by W.N.L.A. and contractors:

On gold mines	188,094
On coal mines	9,060
On diamond mines	14,654
Total	211,808

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

The Witwatersrand.

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	14,300	80	4,506	£19,140
Bantjes Consolidated	29,700	100	8,655	36,764
Brakpan Mines	53,000	160	18,042	76,637
City Deep	37,900	150	17,138	72,798
City and Suburban	26,000	155	11,862	50,387
Cinderella Consolidated	8,250	45	3,321	14,107
Consolidated Langlaagte Mines	49,300	100	14,876	63,189
Consolidated Main Reef	22,443	110	8,175	34,725
Crown Mines	186,500	660	67,228	285,566
Durban Roodepoort	13,872	90	3,535	15,016
Durban Roodepoort Deep	26,800	100	9,251	39,296
East Rand Proprietary Mines	169,000	620	59,948	254,643
Ferreira Deep	55,790	250	28,459	120,886
Geldenhuis Deep	56,500	300	19,594	83,230
Ginsberg	15,090	80	5,067	21,523
Glencairn Main Reef	20,968	160	3,738	15,870
Geduld Proprietary Mines	14,450	50	4,507	19,145
Jupiter	39,100	120	9,480	40,268
Jumpers-cum-Treasury	5,160	50	2,321	9,859
Knights Deep	100,800	400	17,773	75,495
Knight Central	25,150	110	6,881	29,228
Lancaster West	—	—	6	25
Langlaagte Estate	52,556	200	13,849	58,827
Luipaardsvlei Estate	17,450	60	4,621	19,629
Main Reef West	19,295	100	6,948	29,513
May Consolidated	15,530	100	3,274	13,907
Meyer and Charlton	14,635	75	8,008	34,016
Modderfontein B.	35,210	80	16,937	71,944
New Goch	26,950	120	6,300	26,761
New Heriot	12,809	70	5,769	22,381
New Modderfontein	41,350	180	20,635	87,652
New Primrose	25,200	160	8,389	35,634
New Rietfontein Estate	15,740	120	4,067	17,276
New Unified	12,300	60	3,696	15,700
Nourse Mines	49,900	260	18,059	76,710
Princess Estate	21,200	60	6,478	27,517
Robinson	59,800	250	24,124	101,472
Robinson Deep	58,600	200	18,986	80,647
Randfontein Central	229,285	900	66,308	281,658
Roodepoort United Main Reef	25,713	50	6,046	25,682
Rose Deep	67,750	300	22,128	90,396
Simmer Deep	61,100	180	11,595	49,252
Simmer and Jack	72,700	320	18,177	77,211
Spes Bona Tribute	6,223	40	1,394	5,921
Van Ryn Estate	24,710	140	9,144	38,841
Village Deep	46,500	180	17,460	74,165
Village Main Reef	35,300	220	15,388	65,364
Vogelstruis Estate	13,255	80	3,556	15,105
West Rand Central	2,019	20	825	3,504
West Rand Consolidated	30,500	100	10,118	42,979
Witwatersrand	37,510	220	11,620	49,359
Witwatersrand Deep	46,700	245	16,323	69,336
Wolhuter	29,400	120	8,874	37,604
Miscellaneous producers	—	70	4,155	17,651
Outside Districts.				
HEIDELBERG—				
Nigel	13,000	75	4,658	19,786
Sub Nigel	4,780	20	2,118	8,997
BARBERTON—				
Barrett	—	—	227	939
Sheba Rosetta	—	—	225	956
Sheba	896	20	3,165	13,444
Worcester Exploration	6,200	40	1,319	5,603
LYDENBURG—				
Ceylon Lydenburg	—	—	193	837
Glynn's Lydenburg	3,866	20	1,894	8,045
Transvaal Gold Mining Estates	14,550	75	10,820	45,962
KLERKSDORP—				
Quest	4,153	35	741	3,148
Miscellaneous producers	—	—	5,452	23,185

THE WEEK IN THE SHAREMARKET.

Crisis Satisfactorily Negotiated—Quiet and Waiting.

The sharemarket passed through the crisis of last week surprisingly well. In London last Saturday something approaching a panic set in; but by the time the market re-opened here, prices had made a general recovery. The mines have suffered very little damage, and the July output may not be much affected on many properties. Naturally the more speculative stocks suffered most during the trouble, and Zaaiplaats reacted further in price. Diamonds also were weaker for no other reason than the general state of the market. An all-round improvement may now be looked for, as conditions gradually return to the normal.

	Friday, 4th	Tues., 8th.	Wed., 9th.	Sat., 10th.
African Farms	13 9	15 9	15 3	15 0
Apex Mines	21 6s	22 3B	22 0B	22 0B
Bantjes Consolidated	—	19 0B	18 0B	18 6B
Benoni Consolidated	—	3 0B	3 3	3 0B
Blaauwbosch Diamonds	120 0s	—	—	—
Brakpan Mines	57 6	63 0	61 0B	62 0*
Breyten Collieries	28 0B	27 0B	27 0B	—
British S.A.	—	19 0B	—	19 0B
Bushveld Tins	0 6B	0 9	0 7B	—
City & Suburban (£4)..	39 9	43 0	40 0B	42 0B
City Deeps	51 3	56 0	54 0	53 6B
Cloverfield Mines	1 1	5 0	4 9B	4 9B
Consolidated Langlaagtes	24 6	26 0B	25 6B	25 9B
Consolidated Main Reefs	16 0	17 6	17 0	17 0B
Consolidated Mine Select.	9 0s	11 0B	—	—
Coronation Collieries	—	11 0s	14 0s	—
Coronation Freeholds	0 4	—	0 5	—
Crown Diamonds	11 0	12 9	12 6	12 3
East Rand Centrals	7 9B	8 6B	8 6	8 0B
East Rand Coals (2/6)	1 9	1 9B	1 9B	—
East Rand Deeps	2 0B	2 0B	2 0B	2 3
East Rand Props.	45 0B	51 0B	51 0	50 9B
East Rand Debs.	—	—	£85B	—
Eastern Golds (1/-)	1 3B	1 3B	1 3B	1 4B
Frank Smith Diamonds	10 0B	13 3	12 3B	12 0
Geduld Props.	18 0B	22 0	21 9s	21 6
Glencoe (Natal) Collieries	8 6s	—	7 6B	7 0B
Glynn's Lydenburgs	17 0	—	18 0s	18 0s
Government Areas	19 9	22 0	21 3B	21 6
Hex River Expls.	0 6B	0 6B	0 6B	—
Jumpers	—	—	3 0B	—
Jupiters	—	9 0	7 6B	8 9s
Kaalfontein Diamonds (2/6)	—	—	0 4B	0 6s
Klerksdorp Props.	—	2 0B	2 0B	2 0B
Knight Centrals	7 6	8 9B	8 6B	9 0
Lace Props.	—	3 3	3 0B	3 0B
Lydenburg Gold Farms	—	—	—	3 0B
Main Reef Wests	8 0B	10 0	10 0	9 9
Middlevlei Estates	1 0	1 0B	—	1 0B
Modder B's	69 9B	73 6B	71 0B	72 6B
Modder Deeps	30 0B	33 0	31 6B	31 6B
Natal Navigation Collieries	—	—	16 0s	16 0s
New Era Consolidated (5/-).	6 3B	6 9	6 9	6 9
New Geduld Deeps	2 0	2 0B	2 3B	2 4B
New Kleinfonteins	—	21 0B	20 0B	20 6
New Modders	—	—	—	220 0B
New Rietfonteins	4 6	—	4 0B	4 6B
New Unifieds	13 9s	14 0s	13 9s	—
O.F.S. and Transvaal Diamonds ..	1 6	1 10s	1 7B	1 6B
Pretoria Cement Co.	—	—	18 0B	19 0B
Princess	6 6s	6 0s	5 9B	—
Rand Klips	1 2B	—	1 3B	1 3B
Rand Nucleus	2 0B	2 0B	2 2	2 0B
Randfontein Deeps	2 6B	3 6B	3 6B	3 9B
Randfontein Estates	21 0B	26 6	25 6B	25 3B
Roberts Victors	—	—	32 0B	33 0
Robinson Deeps	—	34 0B	—	—
Rooiberg Minerals	28 0	32 0	29 6	28 0
Ryan Nigels	3 6B	3 6B	—	3 6B
Shebas	4 10B	—	4 6B	5 0B
S.A. Breweries	37 0B	37 0B	38 0B	38 0B
S.A. Lands	3 0B	3 6B	3 6	3 6
Springs Mines	—	16 6	16 3B	16 3
Sub Nigels	9 0B	11 6	11 0	—
Swaziland Tins	38 0B	44 0	41 0B	39 0B
Transvaal Coal Trusts..	33 6	40 0	36 0	36 9
Transvaal G.M. Estates	50 3B	52 6B	—	—
Van Ryn Deep	27 6	31 3	30 6	30 6B
Village Deeps	39 0B	41 6	40 0B	—
West Rand Estate	—	—	3 6B	—
Witbank Collieries	43 0B	43 0B	42 0B	—
Witwatersrand	61 0	67 0B	65 0	61 0B
Wit Deeps	52 9	58 0	57 0	57 6
Wolhuters	12 0	13 0B	13 9	11 3
Zaaiplaats Tins	32 0	38 6	33 9	31 6

B Buyers. S Sellers. * Ex London.

Mr. G. H. Blenkinsop, M.Inst.M.M., has left for the Prieska District.

Kolmanskop Diamonds.

The output of diamonds from the Kolmanskop property at Luderitzbucht for the month of June was 8,003 carats. The low production is due to the fact that unusual and very heavy rains were experienced at Luderitzbucht during the month, which seriously impeded work on the property.

INVESTORS' DIARY.

The following company meetings have been announced:—

July 30.—Booysens Estate.
July 30.—Middlevlei Estate.
July 31.—Glynn's Lydenburg (Special).
Aug. 5.—City Deep.
Aug. 26.—Glynn's Lydenburg (Special).
Aug. 26.—Transvaal Gold Mining Estates (special).
Sept. 19.—Transvaal Gold Mining Estates (special).
Sept. 26.—Simmer and Jack Prop.
Sept. 26.—Sub-Nigel.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME

His Majesty's: Holloway Company	8.15
Standard: Quinlan Opera Company	See bills.
Empire	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9

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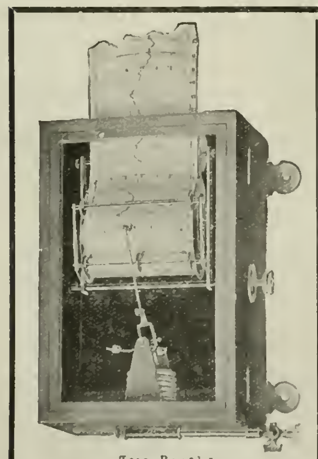
Engineering Notes and News.

Comparative Costs of Rand Hoisting Systems.

The flat dip of the Witwatersrand reefs, as is well known, makes the problem of hoisting a peculiar one. For the mines not situated on the outcrop, three possible solutions exist: a shaft entirely vertical with long cross-cuts to the ore body; a turned-vertical shaft, that is, a shaft vertical to a point near the intersection with the reef and inclined from that point; and a combination of vertical and inclined shaft with separate hoists operating on each portion and involving a transfer of ore underground. The turned vertical shaft is pretty well discredited now. The accompanying table, from an article by Mr. R. C. Warriner, describing the Crown Mines, Ltd., furnishes an illuminating comparison of the costs of hoisting through a vertical shaft and a two-stage system. No. 5 is a vertical seven-compartment shaft, 3,431 ft. deep. The hoisting equipment consists at present of two double cono-cylindrical drum electric hoists, each driven by two 1,420-h.p., 500-volt motors on the Ward-Leonard system. The skips hold eight tons each, weigh 8,700 lbs. empty and are hoisted at a rate of 46 per hr. from a depth of 2,257 ft., near the 13 level of the mine, a main haulage level. The man cages are four-deck, carry 80 men each and handle the shift of 3,200 men in 1¾ hr. One engine runs continuously on rock. The other handles the men in shifting. The bailing represents the extraction of accumulated slimes from the settling sump before pumps were installed. The actual hoisting point is the ore pocket 200 ft. below the 13 level. No. 7 shaft is a two-stage arrangement. The vertical portion is served by two double-drum hoists converted from steam-drive to electric by coupling direct to two three-phase, 2,000 volt, 50-cycle, 930-h.p. motors. The four skips hold four tons each, weigh 5,130 lbs. empty and are hoisted at the rate of 60 per hr. The vertical portion of the shaft is 1,085 ft. The man cages are three-deck, holding 36 men. The shift of 1,000 men is raised in 1¼ hr. The inclined portion of the shaft is equipped with two double-drum electric hoists, each geared to one three-phase, 50-cycle, 2,000-volt, 655-h.p. motor. The four skips weigh each five tons. The length of the incline is 2,004 ft., the dip 33 deg. The ore handled through this shaft comes on an average from the seventh level of the mine. The figures are striking, as, although the ore of the No. 5 shaft comes from a greater depth, the average cost of power per ton handled is about 4·56c., as against 6·3c. for that handled on the two-stage plan. From this, it would appear that hoisting in two stages is more expensive by about 50 per cent. in power cost alone. It should be noted that the double-stage hoisting is done on a smaller scale, however, which might be considered to offset the shallower depth. Additional costs, such as more engine drivers, supplies and shop and maintenance charges also favour the single-shaft system. A full comparison of the methods would involve points not gone into here.

POWER COST HOISTING IN SINGLE-STAGE AND DOUBLE-STAGE SYSTEMS.

		Trips Made.							
	Month.	Total Number.	Percentage of Ore	Percentage of Men and Material	Percentage of Water	Tons Hoisted	Total Power Units Consumed	Power Units per Ton	Cost per Ton. Cents
No. 5 Shaft	September	13,949	91·6	5.6	2·9	88,044	405,758	4·60	4·8
	October	16,416	91·0	8·0	1·0	105,836	428,201	4·05	4·2
	November	17,511	84·4	9·0	6·6	101,896	456,216	4·48	4·8
	December	18,923	81·5	8·9	9·6	109,430	478,411	4·38	4·6
	January	23,194	85·7	10·6	3·7	135,940	554,973	4·08	4·2
No. 7 Shaft Vertical Portion	November	23,717	73·0	27·0	—	68,638	196,767	2·87	3·01
	December	24,269	75·0	25·0	—	71,082	211,910	2·98	3·14
	January	26,559	72·5	27.5	—	74,224	223,800	3·01	3·16
No. 7 Shaft Inclined Portion	November	14,325	57·0	43·0	—	30,030	84,639	2·81	2·94
	December	14,927	55·0	45·0	—	29,289	87,038	2·97	3·12
	January	16,208	56·0	44·0	—	28,912	98,128	3·39	3·56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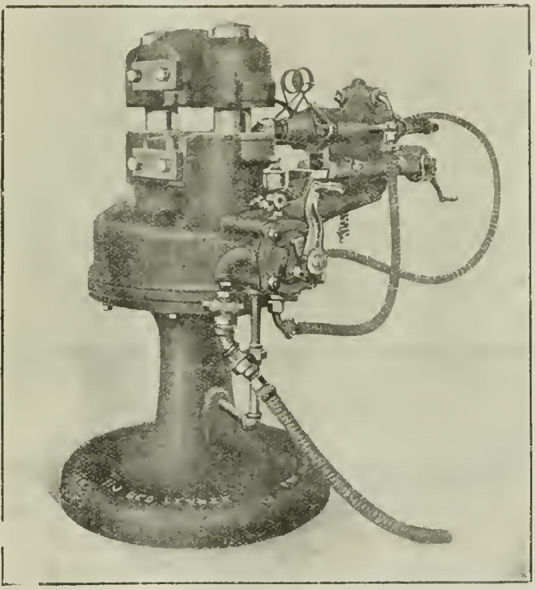

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Automatic Door for Ventilation Control.

Ventilation continues to engage the attention of managers right along the reef, and the following description of a device in use at the Jupiter will doubtless prove of interest. At this mine there are two shafts, the Howard and the Catlin, both of which are part vertical and part inclined. The bottom of the Catlin is 5,040 feet vertically below the surface and at these depths the heat is great. Mechanical ventilation is employed and to guide the air through the stopes, automatically operated doors are provided on the levels. A sliding door is made in two leaves which slide laterally by means of sheaves on 1-in. inclined round irons. The doors are made of a layer of 1-in. vertical boards and a layer of $1\frac{1}{4}$-in. horizontal boards. The sheaves are six inches in diameter and carry the doors by iron straps 3x28 in. The round irons are carried on timber pieces 3x3 in. by 4 ft. 3 in., inclined from the centre of the drift at an angle of 10 degrees. As the doors are forced open, the sheaves roll out and up on the round irons against gravity, and, when released again by the passage of the car, they slide togethed by their own weight The doors are actuated by the four angle irons set two on each side so that cars from either direction will open the doors. Each angle has one end pivoted on the inner edge of the door, and the other end slotted and moving on a fixed pin. They are set at a height to catch a car body, and on each side of the door one rail is slightly higher than the other. The car entering between them forces them apart and opens the doors, and as it passes, allows them to close in a similar manner. The angles are $2\frac{1}{2}$ x $2\frac{1}{2}$ in. and are 10 ft. long, set with one outer side up and one toward the centre of the drift. The drift, approximately 7 ft. wide, is closed for the most part by a 1-in. wood brattice only enough opening, 3 ft. 4 in., being left for the door to cover, as will admit a car. This opening is contained in a frame of 6 x 6-in stuff, to which, as well as to slanting 3 x 6-in. pieces, the 1-in. brattice is fastened. The pins on which the angles slide are carried by a frame of 6 x 6-in. material.

Prime Movers for Electric Power.*

[By Dr. S. Z. De Ferranti, Past President I.E.E.]

Notwithstanding the amount that has been written regarding the different systems of driving electric generators, the subject still seems to be one of considerable interest. The position to-day is that the steam turbine is in possession of the field, and that gas and oil engines are looked upon as likely alternatives. Many people believe that it is only prejudice or the fear of doing something new that prevents engineers from using these two latter methods for generating their power. I do not, however, agree with this view, and believe that engineers are using the only means that are at present economically available for the work they have to do. As we are a coal-producing country, it is evident that coal is our natural fuel. The very fact of oil being so sought after as fuel for certain purposes puts it out of the question for general power production. A good steam turbine and boiler plant will to-day give back 15 per cent. of the energy of the fuel as electricity. As high an efficiency as $18\frac{1}{2}$ per cent. has actually been obtained in practice. It is probable, however, that this is by no means the limit of economy, and that developments in this class of machinery will result in an efficiency of 25 per cent. being obtained in the near future. The next coal-burning machine that we have to consider is the gas engine. With it we have to consider not only the efficiency of the machine itself, but also that of the gas producing plant. When the system is considered from this point of view, its efficiency is probably between 20 per cent. and 22 per cent. With this process there should, of course, be worked by-product recovery. Although it appears evident that in the future all coal must be gasified, and its by-products recovered, it does not seem that present knowledge enables this to be done at sufficient profit for it to be generally adopted. In the oil engine we have a machine which represents the highest efficiency yet realised. Moreover, test figures and those obtained in practice agree very

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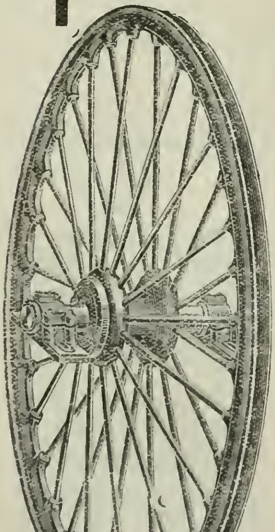
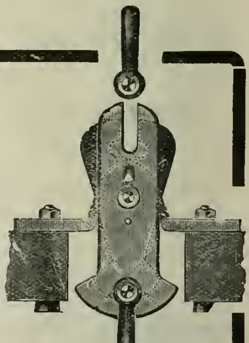
*Abstract of paper read before the I.M.E.A.





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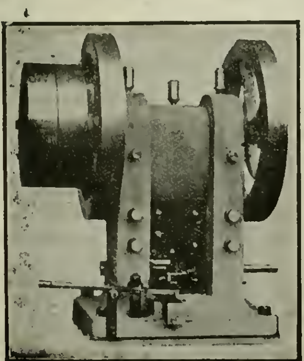
closely. The efficiency, as already defined, may be taken as between 28 per cent. and 30 per cent. The question of stand-by losses may next be considered. In the oil engine there is practically no loss under this heading. In the gas engine there is the producer loss, and in the turbine the boiler loss. These will vary very much with the nature of the load, and where the plant is well designed and run, and the load factor is good, they may be reduced to a small quantity. Both the oil engine and the gas engine are, however, badly handicapped in relation to the steam turbine by their incapacity for dealing with overloads which the station must always be in a position to meet. With regard to the question of the labour involved in running and maintaining the plant, as matters stand to-day the turbine installation is undoubtedly the best, but it is hard to make a direct comparison, as the number of generating units with either gas or oil would be so great. It is, however, certain that the plant which is the simplest will always have the advantage, and where one is purely rotary and the other reciprocating there can be no question at all. In the matter of capital cost the turbine system is again much the best, the simplicity, large units and small space occupied contributing to this result. The size of the units on the turbine system compared with those on the other systems is perhaps the greatest determining factor in the case. The turbine is to-day adequate in fulfilling the demand, whereas the other two systems are not. Moreover, combined with its boilers and auxiliary plant, it is a simple means of generating power. Reliability of operation is, of course, vital, and here again the turbine system scores on account of its simplicity and because in working its parts are not subjected to either high or uncertain stresses. In practice the turbine system has proved its capacity to meet the demand that is made on power-producing plant. All this goes to show that the course now allowed by engineers in the selection of their plant is the right one, and that they really have no option in the matter. Looking at the question in the light of possible developments in the future, I cannot help thinking that as long as engines are used the rotary principle will be followed. For the moment the steam turbine system will be perfected so as to improve its efficiency and fuel consumption; later on, when the turbine can be made of the internal-combustion type, better economies still will be obtained.

COMPARATIVE EFFICIENCIES IN USE OF COMPRESSED AIR.

[By G. A. DENNY.]

My aim in the following note will be, I believe, perfectly patent to my colleagues. No attempt is made to support by more than generalizations the statements made, the object being to supply a skeleton around which useful and informing discussion may build a body of opinion and experience, which will be instructive to us all. In choosing the subject of compressed air transmission, I have especially in mind that it is one in which we are all interested, and all have more or less costly experience. Moreover, it is a branch of our mechanical operations—invaluable and essential though it may be despite its deficiencies—which offers an excellent target for the critic purposely seeking only its misdemeanours, in order to invite discussion in its defence. In a similar spirit, but from an opposite standpoint, the benefits of hydraulic transmission are touched upon, with the intention of provoking critical discussion. The problems of air compression and transmission are as numerous as they are complex. Pressure, temperature and volume have an interchangeability of relationship, which whilst fully covered by theoretical formulae, are most elusive in habit, and unsubmissive to theoretical demands in every-day practice. Our definitions of free air generally apply to pressures of one atmosphere at sea level, or 14·7 lbs. and 60 deg. temperature F. But what infinity of variation is there from those bases. Every latitude, every elevation, almost all specific localities, have their own peculiar involutions of volume, temperature and pressure, each new combination giving rise to relationships, singular to themselves. Absolute temperatures must be considered in all cases, whether dealing with free or compressed air, as weight and pressure will vary in accordance with the absolute temperature of the original volume, the latter also suffering variations in conformity with the rise or fall of the absolute temperature. At 30 deg., or 491 deg. absolute, a cubic foot of dry air at sea level and average atmospheric pressure weighs ·0811 of a lb., and the volume of 1 lb. at this temperature and pressure is 12·336 cub. ft. At 90 deg. F.—absolute 551 deg.—a cubic foot weighs ·0722 lb., with a volume for 1 lb. of 13·853 cub. ft. At 200 deg.—absolute 661 deg.—a cubic foot weighs ·0602 lb., with a volume of 16·907 cubic feet. The relationships of temperature, pressure and volume have been succinctly stated as under:—(1) The absolute pressure of air varies inversely as the volume, when the temperature is constant. (2) The absolute pressure varies directly as the absolute temperature when the volume is constant. (3) The volume varies as the absolute temperature when the pressure is constant. (4) The product of the absolute pressure and the volume is proportional to the absolute temperature. When air is compressed, an increase of temperature takes place but not proportionate to the pressure, nor will air which is taken into the cylinder at zero have a temperature increment similar to air which is taken in at 100 deg. At two atmospheres gauge pressure, for instance, air of an initial temperature of zero will have risen to 170 deg., whilst air of an initial temperature of 100 deg. will have risen at the same gauge pressure to 320 deg. In the higher pressures the rate of temperature increase is much lower. For instance, air of an iniital temperature of 100 deg. will only rise about 20 deg. between gauge pressures of 21 and 23 atmospheres. The importance of the question of original temperature of the free air cannot be over-estimated, since that volume of free air which we take into the cylinder is in the last resort the unit we have to count upon for work. If the air is so heated at the moment compression begins, that its volume is increased by say 20 per cent., we are actually reducing the capacity of our machine—from a basis of cool air—to that degree, and have to exert as much power for the compression of an 80 per cent. cylinder charge as would be required for an 100 per cent. charge of cooler air. Even when every precaution has been taken to provide the coolest and cleanest supply of air available to the compressor, we still have the heated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condition of the air cylinder itself to contend against, which causes an immediate rise in the temperature of the entering air, reduces the volume, and deprives us of a fixed, but unascertainable amount of eventual energy. No determination has ever been made of the exact rise in temperature of the entering air in any given instance, nor does it appear likely from the nature of the case that it will ever be accurately fixed, as the indicator gives us no information on the point. The safest way to minimize losses in this direction is to lead the air into the cylinders from cool places, in channels or conductors of wood or concrete, or other material which is a bad heat conductor or radiator. Having the air in the cylinder, we now proceed to reduce its volume and increase its pressure. If this could be done without creating heat, the air would conform to the ordinary law of gases, namely, that its volume would vary inversely to the pressure, and a diagram of the operation in the cylinder would give us an isothermal compression line. In that case (if it were possible), assuming the air to be originally at one atmosphere pressure, sea level, and 60 deg. Fah., and that we have compressed it to 80 lbs. gauge pressure, the original volume of air taken at 1, would be reduced to ·1552, and the mean pressure per stroke would be 27·33 lbs. It is well to keep these ideal conditions in mind, in order to see how far short of them our actual practice falls. In the same conditions as above, and assuming no air cooling, the volume of air after compression is ·267 of the original unit, and the mean pressure per stroke 36·6 lbs. That is to say, in practice, where no cooling arrangements exist, we require 34 per cent. more power for the air compression, because the volume of air has been increased by heat. In the best practice, with all the cooling arrangements possible, or practicable, a result somewhere between the two figures is attainable. The methods of air cooling that have been tried are three, namely:—(1) Water jacketing of the cylinders. (2) Water spraying in the compressing cylinder. (3) Cooling in a special apparatus between the compression stages. As we are treating at the moment of only single stage compression, the first two are all to which we need refer. Of the two systems under notice, that of water-jacketing is the one almost universally adopted. In this system, however, the cooling effect is at best very ineffective, since the inner surface of the cylinder can only be slightly cooled, and can therefore only effect a film of adjacent air, leaving the large bulk of air in the central portion of the cylinder almost untouched. For this reason cylinders of small diameter must allow of better cooling than large cylinders, but other mechanical considerations will outweigh this advantage, where a large output is required. The practice of water spraying in the compressing cylinder has almost been abandoned. The practical objections to it are:—(a) That it produces very moist air, which freezes in expanding, and blocks the exhaust passages of pumps, etc., with ice. (b) That it necessitates very large clearances in the cylinders and restricts operations to comparatively low piston speeds. (c) That it gives rise to serious difficulties in the lubrication of the cylinder, increases friction, induces excessive cylinder wear, and reduces efficiency. If it were possible to utilize the heated air immediately, without loss in volume due to cooling, we should not have to deplore the large power losses represented by the difference between isothermal and adiabatic compression. But in practice the air after compression is discharged into receivers and pipe lines, and returns more or less to its original temperature, with a corresponding shrinkage in bulk, and with lessened energy possibilities. Attempts to restore in part the lost energy due to volume shrinkage are made by reheating the air, near the point at which it is to be used, but it may be said in general that no reheating apparatus finds a place in mining installations, and therefore no recovery of the loss due to adiabatic compression is made. It is perhaps well to emphasize the fact that an air compressor has two quite separate and distinct functions to perform, namely:—(a) That of increasing the pressure of air from a pre-existing to some determined pressure. (b) That of discharging the air of a determined pressure into the mains. We have seen that the admission of the maximum volume of cooled air into the cylinder is the first desideratum in the process of increasing pressure, since the capacity of the machine is reduced and power is wasted in proportion to the temperature of the air above a certain practicable minimum.

(To be continued.)

Pomona Diamonds.

The ordinary general meeting of shareholders of the Pomona Diamonds, Ltd., took place at Capetown this week. Mr. G. W. Steytler presided. The chairman, in moving the adoption of the report, said:—The accounts to 31st May, 1913, which I now have the pleasure of submitting to you, are the first statements of affairs since work was commenced on the fields. You will see from the accounts that credit has not been taken for the royalty payable on the diamonds collected, beyond the amounts actually received in cash, and that up to 30th April there were 36,515 grammes collected on which the royalty had not been received. Since writing the report, advice has been received that the output for May was the highest yet reached, namely, 13,128 grammes, equal to about 64,064 carats. To the end of May, therefore, royalty has still to be received on 49,643 grammes, and on the basis of the sale price according to the last remittance of about 43s. 9d. per carat, the royalty due to the company would be about £7,950, equal to a dividend of about 43¾ per cent., which would make a total dividend on the results for the 10 months to 31st May of 70 per cent. As will be seen from the report, in addition to the 26¼ per cent. paid to 31st May, 1913, a further dividend of 8¾ per cent. was paid on 14th June, which, on the basis of calculation above, would leave approximately 35 per cent. still to be paid on the output to the end of May. According to a cable of 24th June, appearing in the Press, the Pomona Diamanten Gesellschaft have decided to restrict the output of diamonds to 50,000 carats per month. Information has now been received that the Diamanten Gesellschaft and the Pomona Gesellschaft intend to continue the railway, constructed by the former through the Pomona territory, according to an agreement come to, to Elizabeth Bay at a cost of about £60,000, where it can join another line to Luderitzbucht and so have through communication. The cost of this does not, of course, concern this company in any way.

Good Positions Vacant.

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings, corner Eloff and Pritchard Streets, Box 2061.

Jumpers-cum-Treasury.

The following is the result of the joint working of The Jumpers and Treasury Mines during last month:—50 stamps, working 25 days, crushed 5,160 tons, yielding 1,218 ozs. fine gold from mill, 560 ozs. fine gold from tailings by cyanide, 262 ozs. fine gold from current slimes, 390 ozs. fine gold from accumulated slimes; total from all sources, 2,430 ozs. fine gold; value of output, £10,207; point profit for the month, £1,008; position of joint gold reserve at end of month, 495 ozs. fine gold.

Sheba G.M. Co.

The following are the results of the working of the Sheba and Rosetta Mines for the month of June, 1913:—Sheba: Crushed 6,550 tons, yielding 3,165 ozs. of fine gold; estimated profit £4,418. Rosetta: Crushed 897 tons, yielding 186 ozs. fine gold.

Important Sale.

The property of the Belle Vue Gold Mining Company is in the market. : This is a valuable mining proposition, fully equipped, and Mr. J. C. Burchmore, favoured with instructions from the owners, will sell it by public auction, at the mart, 111, Fox Street (next Jeppe Arcade), Johannesburg, on Wednesday, 13th of August, 1913, at 11 a.m., without reserve. The property consists of 12 prospecting claims and one digger's claim held under gold licences, and 100 claims pegged under base metal licence, the whole forming one block, approximately 22 claims along the strike and 5 claims deep, situate at the east end of Castle Kopjes, on the Murchison Range, 18 miles by good level road from Gavelotte Station, together with water right thereto, machine stand, and 5-stamp equipment, situate on the Melati River, two and three-quarter miles distant. Over £6,000 has already been won from two claims alone. The others have not been touched yet. The reefs are holding everywhere, and the average dip is 70 degrees. In addition to the above will be sold a block of 150 claims, known as the Senator Camp, commanding a huge strike of copper-bearing deposit, distant about two miles from the above property, being ancient working claims with values up to 40 per cent. of copper.

Belle Vue Gold Mining Company.

THE OPPORTUNITY OF A LIFETIME.

SALE OF

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FULLY EQUIPPED.

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AT THE MART, 111, FOX STREET
(next Jeppe Arcade), Johannesburg,

On WEDNESDAY, 13th of AUGUST, 1913,
AT 11 A.M.

WITHOUT RESERVE. WITHOUT RESERVE.

12 Prospecting Claims and one Digger's Claim held under Gold Licences, and 100 Claims pegged under Base Metal Licence, the whole forming One Block, approximately 22 claims along the strike and 5 Claims deep, situate at the East end of Castle Kopjes, on the Murchison Range, eighteen miles by good level road from Gavelotte Station, together with Water Right thereto, Machine Stand, and 5-stamp equipment, situate on the Melati River, two and three-quarter miles distant.

OVER £6,000 HAS ALREADY BEEN WON FROM TWO CLAIMS ALONE. The others have not been touched yet. The Reefs are holding everywhere, and the average dip is 70 degrees.

AND IN ADDITION TO THE ABOVE WILL BE SOLD—

A BLOCK OF 150 CLAIMS, known as the Senator Camp, commanding a huge strike of Copper-bearing deposit, distant about two miles from the above property, being Ancient Working Claims with values up to 40 per cent. of Copper.

Further particulars on application to the Auctioneer.

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Finance, Commerce, and Industries.

New Coal Rate. With regard to the new coal rate which is to be brought into operation on October 1st, for the purpose of encouraging export bunker trade at Capetown, roughly the new rates will work out on the following basis:—Transvaal Mines: Vereeniging, Oogies, Minaar, Witbank, Witbrook and Springs collieries, 14s. per ton, with 1s. rebate for coal exported. Breyten, 14s. 10d., with 1s. rebate. Orange Free State mine, Coalbrook, 14s., with 1s. rebate. Natal mines: Elandslaagte, 14s. 4d., with 1s. rebate; Glencoe and South African Collieries, 14s. 9d., with 1s. rebate; Newcastle, 15s. 2d., with 1s. rebate. The effect of these alterations of rebates will be to cheapen Transvaal coal and it will come down to about 1s. per ton less than Natal coal; but since it is stated to be not of such good quality, it is anticipated that Natal coal will continue to hold its own. The cost of Natal coal will not be reduced, since the new railway rebate will practically be the same as ocean freight. The opinion is held in commercial quarters that before these new railway rates can be of great service to the community the Railway Department will have to considerably increase their supply of rolling stock.

* * * *

The Latest Trade Returns. The official Customs and Excise figures for the Union for the first five months of the year show some interesting features. The imports during May were practically half a million in excess of those for the corresponding month of the previous year. For the whole five months the increase in imports amounted to very nearly a million sterling. In exports the May figures show a decline, but for the whole five months the exports increased by nearly three and a half millions. The general position reflects continued expansion, but there are the customary qualifications. In regard to the imports, it is significant to note that nearly the whole of the million increase for the five months—or £978,245, to be precise—was accounted for by articles of food and drink, such as figure prominently in the periodical statement which the Government now issues of articles imported that might have been produced within the Union. Had this increase of nearly a million in food and drink imports for five months been the outcome of normal conditions, it would have been a serious indictment of our agricultural producers. What it really does, however, is to afford one more illustration of the serious set-back to which the agricultural industry in this country is liable on account of drought. This is clearly shown by the fact that such imports as wheat and flour were among the principal contributors to the increase, along with a substantial import of maize, which we were exporting in considerable quantities during the previous year. There are also large increases in such consumable commodities as butter, cheese, lard, sugar, confectionery, etc., all promising well from the standpoint of Customs revenue, but indicating a decided falling off in the ability of the Union to provide for its own requirements in the shape of the people's food supplies, during the period under review. The imports of general merchandise, apart from those of food and drink, imply that the balance of trade in this respect has remained on the whole stationary, with, in some respects, a slight downward tendency, the most noteworthy exception being the increased importations of vehicles, explained by the rapid development in this as in other countries of motor traffic. Analysing the exports, the figures show that the slight decline in volume for the single month of May as compared with May, 1912, was due to a drop in the gold output. For the five months, as already stated, the exports were nearly three and a half millions in excess of those for the corresponding period of the previous year. To this big decrease diamonds contributed to the extent of nearly a million and a half, while the increase in gold exports for the five months was £600,000. Of the nearly thirty millions of total exports for the five months, gold and diamonds account for over twenty-one millions.

Cost of Living Report. A report has just been returned by a committee appointed under the auspices of the Durban Town Council concerning the influences which have to do with the increase in the cost of living. An inquiry has been conducted throughout South Africa for material in the investigation, and some of the testimony given is interesting. The Assistant Town Clerk of Durban, Mr. Henderson, for instance, reported the result of inquiries he had made at Capetown, Port Elizabeth and East London. For a five-roomed house in Capetown and its nearer suburbs the average rent would be £6 per month. At Port Elizabeth house rents were higher than in Durban for five and six-roomed houses in good localities. At East London the conditions were practically the same as at Port Elizabeth. At all three Cape ports municipal rates were higher than in Durban, the Capetown rate being 3 5-8d. The committee find that house rents are not higher in Durban than in Cape ports, having regard to the class of houses and the amenities at Cape ports. A cheaper class of workman's cottage is obtainable, but those cottages are of an inferior description and would be unsuitable for habitation in the climate of Durban, where, they say, perfect sanitation is a sine qua non. There are, the committee state, not enough houses in Durban to meet requirements, and they add their opinion that so long as land remains at its present high price and other conditions affecting building, e.g., high wages and high cost of building materials, remain unchanged, house property cannot become a remunerative investment. The committee find that the increase cost of building is mainly due to: (1) The higher scales of wages of mechanics; (2) the increased cost of materials at the places of production; and (3) the higher freights on these materials. A more competitive market in timber and bricks might have the effect of reducing the prices of these commodities. Certain amendments of the building by-laws would have the effect of slightly decreasing the cost of building houses. A minority report declares in favour of the municipality constructing and letting houses. A huge amount of capital, it is said, is represented by the value of idle municipal lands, and the burgesses are being deprived of revenue which that land should be earning. To utilise part of those idle lands and to cater for the pressing requirements of many, the minority would let the municipality build some houses. The Corporation, the report asserts, could build on a large scale and at a much cheaper rate than the private house owner.

* * * *

South African Breweries. Out of the past year's profits the directors of the South African Breweries Company have been able to make the dividend on the Ordinary shares up to 17½ per cent., this having been also the rate for 1911-12 and 1910-11. A sum of £20,000 has again been added to reserve fund, bringing the total at credit of this account up to £670,000, leaving £38,800 to be carried forward, or an increase of £1,400. These figures are quite satisfactory, the more so when it is remembered that the company is charging considerable sums against revenue in connection with the development of its operations. The financial position of the undertaking has been very strong for some time past, and is now one which the shareholders are entitled to regard with a good deal of satisfaction.

* * * *

Real Estate Corporation of South Africa. The report of the Real Estate Corporation of South Africa, Ltd., for the year ended 31st March last, presented at the meeting on 26th June, states that the accounts show a net profit of £17,138, which is a slight decrease compared with the last balance sheet. Capital expenditure during the year amounted to £1,716. There has been no capital expenditure on Kimberley properties, which stand at the same figure as a year previously. A sum of £1,000 has been written off against depreciation of properties, which now stand at £225,197. The balance from last account, after payment of the final dividend of 5 per cent. for the year, was £14,811, and the balance at credit of profit and loss, after payment of two interim dividends of 2½ per cent. each and the deduction of £1,000 written off against depreciation, is £23,449, out of which the directors recommend a final dividend of 5 per cent., making 10 per cent. for the year. This will absorb £7,500 and leave a balance to carry forward of £15,919.

* * * *

Ohlsson's Cape Breweries.

The report of Ohlsson's Cape Breweries, Ltd., for the year ended 31st March last, submitted at the meeting on 26th June, states that the profit for the year, after charging working expenses, repairs and maintenance of freehold and leasehold properties, and after making provision for bad and doubtful debts, amounts to £85,171. Including transfer fees and £45,361 brought forward, and deducting for cost of additions to plant and machinery during the year £16,952, there is a balance of £113,620. After deducting the usual charges and providing for depreciation of plant, there is a balance of £57,162, out of which it is proposed to pay a dividend of 8 per cent. on the Ordinary shares, carrying forward £33,162. The increasing demand for bottled, in place of draught, beers has made it necessary to instal additional bottle cleaning and filling plant, as well as machinery for economising labour, while further expenditure has been incurred on the equipment of the new brewery at Durban. Though these outlays might properly have been charged to capital, the directors decided to meet them out of the profit brought into the account from last year. The business of the company has shown steady progress during the year, and, notwithstanding the enhanced cost of materials, an increased profit has been earned. The chairman and secretary have recently returned from a visit to South Africa, and were present at the opening of the new brewery at Durban at the end of March last. They have expressed themselves as pleased with the position and prospects of the company's business.

£10,000 for the "I.M.M."

The keen interest always taken in the affairs of the Institution of Mining and Metallurgy by the late Sir Julius Wernher was a constant source of encouragement and gratification to members of that useful association, and just recently there has been further evidence (evidence of a very tangible nature) afforded of his close identification with the "I.M.M." At the seventh general meeting, held at the rooms of the Geological Society on Thursday, April 17th, 1913, the president, before proceeding with the ordinary business, said he had to make an announcement which he was sure would be received with the utmost satisfaction. It was that the Institution had received from Lady Wernher and her co-executors of the will of the late Sir Julius Wernher the sum of £10,000, as a special endowment fund in memory of Sir Julius. The only condition attached to the gift was that Lady Wernher desired that the principal sum should remain intact as an aid in permanently strengthening the Institution, in which her late husband took so much interest. The income was to be devoted to the ordinary purposes of the Institution. Of this sum of £10,000, one-half was given by Lady Wernher personally, and the remaining one-half was allocated from the Sir Julius Wernher Bequest. He was sure the members would wish that their most grateful thanks be returned to Lady Wernher and her co-executors for these splendid gifts. The announcement was received with much enthusiasm. The president, continuing, said he now wished to refer to another matter, and that was the Twenty-first Anniversary Fund. He had been able to report at the Council meeting held on the previous day that a satisfactory start had been made with the subscription list. Now that they had received the handsome gift of £10,000, it was more than ever incumbent upon them, as members of a great profession, to do their individual part. About a fortnight hence it was proposed to issue an interim report of the subscriptions received to that date, and he mentioned the matter so that all who desired to do so could send in their subscriptions within the next fortnight.

New Patents.

292. Frank Simon and John William Scott.—Improvements in mining columns.
293. Frank Simon and John William Scott.—Improvements in feeding means of percussive rock drills, coal cutters and the like.
294 Walter Bolter.—Converted drill sharpener
295. George Heathcote Rotherham.—A renewable shoe shank for stamp mills and the like
296. Richard Ridge Leonard Acutt.—New ammunition carrier and cartridge belts.
297. Harry Brown.—Improvements in ore separating cones and the like.
293. Alfred Whitby and Josiah Whitby.—Improved pole for mine packs.
299. Arthur John Phillip.—Improvements in or relating to shells or cradles of rock drilling machines.
300. Wm. Lippiatt.—Improvements in catches or fastening devices applicable for sliding doors and the like.
301. Giuseppe Antonio and Pietro Provay.—Improvements in tipplers or means for emptying railway trucks and the like.
302. John Godfrey Parry Thomas and The Thomas Transmission, Ltd.—Improvements in and connected with electric power transmission.
303. John Francis Staley and Cyril Frank Jackson.—Improvements in safety mechanism for the winding gear of coal pits and the like
304. George Mellis.—Improvements in or relating to nut locks.
305. Harry Palent.—An improvement in the manufacture of engine packings from leather.
306. Lancelot Usher.—Improvements in sugar-basins and the like.
307. Fred. Grissel, George Warren and George Daniel Hook.—Improvements in the means of securing pumps to cycle frames and the like.
308. Spiro Matelas.—How to manufacture rubber from indigenous roots and the like.
309. Frederick Victor William Swanton and Thomas MacNair.—An apparatus for automatically closing and locking railway carriage doors and such like.

The following new companies, increases and decreases of company share capital, and notices of liquidation have been registered at Pretoria during the month of June, 1913:—

NEW COMPANIES.

Krantz, Ltd., 51 Knox Street, Germiston; registered June 4; capital £1,500.

The Union Bond and Guarantee Corporation, Ltd., 36 Standard Bank Chambers, Johannesburg; registered June 12; capital £5,000.

Young's Motor Bus Company, Ltd., 15 Wilhelm Street, Johannesburg; registered June 12; capital £525.

Miller & Company, Ltd., Erf No. 19, King Edward Street, Potchefstroom; registered June 12; capital £1,000.

Southern Cross Spiritualistic Church, Henwood's Buildings, Pritchard Street, Johannesburg; registered June 14; capital £100.

Leeney's Loving Landlords, Ltd., 30 Aegis Buildings, Commissioner Street, Johannesburg; registered June 16; capital £50.

Germolin, Ltd., 15 Von Weilligh Street, Johannesburg; registered June 19; capital £600.

The Pinedene Lime Works, Ltd., Pinedene, Transvaal; registered June 19; capital £2,523.

Torf Brothers & Zinn, Ltd., 28 Moseley Buildings, President Street, Johannesburg; registered June 19; capital £20,000.

M.C. Tribute Gold Mine, Ltd., 15 Beckett's Buildings, Johannesburg; registered June 26; capital £4,000.

The Rand Cupel and Scorifier Company, Ltd., 707-714 Commissioner Street, Johannesburg; registered June 28; capital £1,600.

FOREIGN COMPANIES.

C. A. Macdonald, Ltd., care of G. F. Clulee, 52 Central House, Simmonds Street, Johannesburg; registered June 5; capital £60,000.

Primus Diamonds, Ltd., care of H. Hargreaves, 85 Cullinan Buildings, Johannesburg; registered June 17; capital £10,000.

Clarke Bros. & Brown (1913), Ltd., care of A. W. Weikert, corner of Bree Street, Newtown, Johannesburg; registered June 21; capital £2,000.

INCREASE AND DECREASE OF CAPITAL.

Henderson's Consolidated Corporation, Ltd., Johannesburg; registered June 5; capital decreased from £1,500,000 to £390,630.

Romola Nigel Gold Mining Company, Ltd., Johannesburg; registered June 12; capital decreased from £50,000 to £10,000.

Criterion Theatres (S.A.), Ltd., Johannesburg; registered June 12; capital increased from £13,000 to £20,000.

Knights Deep, Ltd., Johannesburg; registered June 12; capital increased from £650,000 to £743,526.

New Rand, Ltd., Johannesburg; registered June 13; capital increased from £149,351 to £160,751.

African Theatres Trust, Ltd., Johannesburg; registered June 27; capital increased from £12,500 to £100,000.

NOTICES OF LIQUIDATION.

Motale Copper Developing Syndicate, Ltd., Johannesburg; voluntary.

The Miller Gold Mining Company, Ltd., Johannesburg; voluntary.

The Palladium Theatres, Ltd., Johannesburg; by order of Court.

Pretoria Premier Gold Mine, Ltd., Johannesburg; by order of Court.

Golden Hill Pongola Gold Mining Syndicate, Ltd., Johannesburg; voluntary.

Automobile Notes.

The feeling in regard to motor polo in England seems to be that it is not likely to catch on. The first game played at Ranelagh recently is described as tedious, and as falling far short of the glowing accounts which had preceded its importation from America.

* * * *

In the 500 miles race at Indianopolis the first five cars were: 1, Peugeot; 2, Mercer; 3, Stutz; 4, Sunbeam; 5, Mercedes-Knight. The difference between the first and fifth cars was 38 m. 23 sec. The Sunbeam's is stated to have been the lowest powered engine of the first four cars.

* * * *

The first list of Overseas representatives to the Imperial Motor Transport Conference has been issued by the committee, and an examination of the names shows that every branch of industry and commerce will be fully represented. India sends thirteen, with the Right Hon. the Marquess of Crewe, K.C., Secretary of State for India, as Vice-President; Canada, nineteen, under the Vice-Presidency of the Right Hon. Lord Strathcona, High Commissioner for the Dominion of Canada; Australia, twenty-four, Vice-President the Right Hon. Sir George Reid, High Commissioner of the Commonwealth of Australia; South Africa, sixteen, Vice-President Sir Richard Solomon, High Commissioner of the Union of South Africa; New Zealand, eight, Vice-President the Hon. Thomas Mackenzie, High Commissioner for the Dominion of New Zealand; Crown Colonies, Dependencies, etc., fourteen, under the leadership of Mr. W. H. Mercer, C.M.G., Crown Agent for the Colonies. The meetings of the Conference and the subjects to be discussed will be as follows: Monday, July 21, the fuel question and the possibilities of creating an adequate fuel supply for internal combustion engines within the Empire. Particular stress will be laid on questions relating to the production and use of alcohol as fuel. On Wednesday, July 23rd, the discussion will be on the subject of motor cycles for military use and the production of vehicles suitable for military purposes, and also for ordinary industrial use throughout the Empire. On Friday, July 25th, the discussion will be upon the subject of the carriage of goods and passengers by motor vehicle. The opening of the Conference takes place on July 18th, when the delegates will be entertained at luncheon at Olympia, Kensington, by the President and Council of the Society of Motor Manufacturers and Traders on the occasion of the opening of the exhibition of industrial motor vehicles organised by that Society.

* * * *

The problem of the streets in crowded localities is, under modern conditions of traffic, becoming day by day more urgent in its demands for solution. The necessity for this solution is insistently emphasised by the ever-increasing number of traffic accidents involving, in too many cases, the loss of life and grievous personal injuries. Many of those who have to do with the regulation and control of traffic in these crowded places have been driven to the conclusion, and have given expression to their opinions, that a large proportion of street accidents are due to the carelessness of the pedestrian. It has been urged, and must be driven home, that the foot passenger, in common with every other road user, has obligations and responsibilities to all other classes of traffic occupying the streets at the same time. To claim that the foot passenger has a prior right to the road, and that all other traffic must give way for him, cannot in these days be seriously advanced. He can, and frequently does, by his proceedings, become a danger to traffic, and while it is the duty of wheeled traffic to avoid running him down, it is up to him to refrain from placing himself, through carelessness, in such a position as would make it next to, if not quite, impossible to avoid doing so.

* * * *

A firm in London has issued some particulars of a "home made" still, by means of which crude paraffin, naphtha or coal tar can be converted into volatile motor spirit. It is claimed that for an expenditure of twopence on gas, or three-halfpence on burning oil, four gallons of heavy fuel can be converted into 3½ gallons of motor spirit within two hours. The " still " is said to be automatic in action, and to take up less than two feet of floor space.

* * * *

A wooden tyre for motor vehicles has been invented by Mr. John Henry Knight, of Farnham. It is formed of sections of ash bolted on to the rim in two, three, and four rows, according to the weight of the vehicle. Each block is provided with a steel cleet to prevent its being split by

CONTINENTAL

TYRES.

Reduction in Price,

But no Reduction in Quality.

Ask your Garage for New Price List.

stones on the road. Damaged blocks can be easily replaced by new ones. Experiments carried out with them are stated to have been highly satisfactory, both with light and heavy vehicles, and it is claimed that they possess an astonishing degree of elasticity.

* * * *

Sir Percy Fitzpatrick has recently become the owner of the handsome 20 h.p. 5-cylinder Standard car formerly belonging to Mr. A. T. Hennessy, the Vice-Chairman of the Royal Automobile Club of South Africa, and has, with it, just completed a run through some of the south-western districts to Port Elizabeth. Included in the tour were Montagu, Ladismith, Oudtshoorn, with its Cango caves, George, with its mountain passes, forests and lakes; Knysna, with its beautiful harbour, plantations and excellent roads; Plettenberg Bay, with its successful whaling station; and the Tsitsikama, with its vast forests. The views from Prince Alfred's Pass and the Vlugt, on the way to Avontuur, are magnificent, and the scenery down the Longkloof suffers by comparison. We understand that the car did splendidly and accomplished the long journey of 750 miles without a single mishap—not even a puncture. Mr. Hennessy, it is stated, has ordered another Standard through the South African agents, Messrs. Benjamin and Lawton.

Imperial Motor Transport Conference.

The following are the subjects to be discussed at the forthcoming conference in London:—Monday, July 21st: The fuel question and the possibilities of creating an adequate fuel supply for internal-combustion engines within the Empire. Particular stress will be laid on questions relating to the production and use of alcohol as a fuel. Papers will be submitted by Sir Boverton Redwood, Prof. Vivian Lewes, Mr. A. J. Butterfield, and Dr. W. R. Ormandy. Wednesday, July 23rd: Motor vehicles for military use, and the production of vehicles suitable for military purposes, and also for ordinary industrial use throughout the Empire. Official statements will be made on behalf of the Army Council by Col. H. C. L. Holden and Capt. A. E. Davidson, secretary of the Mechanical Transport Technical Committee. Further papers will be submitted by Col. R. E. Crompton and others. Friday, July 25th: The discussion will be upon the subject of the carriage of goods and passengers by motor vehicle. Papers will be submitted by Mr. W. Worby Beaumont, Col. R. E. Crompton, C.B., and others. The President of the Conference is H.R.H. Prince Arthur of Connaught, K.G., and the chairman of the Executive Committee is the Hon. Arthur Stanley, M.P., chairman of the Royal Automobile Club. The Conference opens on July 18th, when the delegates will be entertained at luncheon at Olympia, Kensington, by the President and Council of the Society of Motor Manufacturers and Traders, on the occasion of the opening of the Exhibition of Industrial Motor Vehicles organised by that Society. In the list of overseas representatives we observe the following names:—Mr. Matthew G. Coates, A.M.I.E.E., consulting engineer, Melbourne; Mr. Stephens, electrical engineer to the Public Works Department, South Africa, and Mr. H. Twycross, under secretary for Posts and Telegraphs, South Africa; Mr. J. Mordey Lamb, town electrical engineer and tramway manager, East London; and Mr. H. Willsmer, representing the Department of Railways, Telegraphs and Telephones, Saskatchewan.

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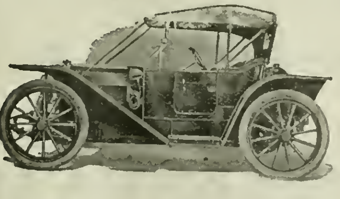

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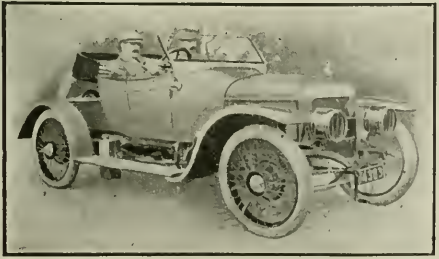

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Zaaiplaats Tin.

The following are the results of operations for June at Zaaiplaats Tin Mine:—Days run, 27·1; ore milled, 3,040 short tons; residues re-treated, 1,437 short tons; concentrates won, 113 long tons; average value of concentrates, 70·5 per cent. metallic tin; estimated profit for the month, excluding Government tax on profits, £9,357; deduct adjustments in respect of estimated value of previous shipments, £138; profit declared for the month, £9,219; capital expenditure, nil.

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Antelope. During the year 1912 the development work at the Antelope resulted in the addition of only 22,000 tons to the reserves. It is explained that a considerable time was occupied in turning the main shaft off on the incline, and much of the work done during the period was of such nature that it did not add anything to the reserves. It will, however, bear fruit this year, when, the manager says, as large a tonnage may be confidently expected during the next two quarters as was added during the whole of 1912. At December 31 it was estimated that the ore opened up amounted to 124,601 tons of 10·1 dwts., 6,217 tons of 8·3 dwts., and 14,579 tons of 5·9 dwts., but since the end of the year considerable additions have been made. The pay shoot at the 9th level, which had been driven on for 245 feet at December 31, has since been extended to 380 feet, averaging 11·8 dwts. over 40·9 inches. The reef has also been cut at the 10th level and driven on for 50 feet, averaging 10.6 dwts. over 42 inches. These recent developments are, in the opinion of Mr. Piper, quite satisfactory. The erection of the reduction plant has been retarded by the exceptional drought of last year, for there was no grass on the 50-mile haul from the railway to the mine or at the mine, and as the transport animals had to be fed from the railway there was much difficulty in getting machinery forward. The position has now been improved by the fall of good rains in February, and if the plant can be brought forward at a reasonable pace it is hoped that it will be ready to start work about next September.

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Notes and News.

Greig Diamonds (Schweizer Reneke Town Lands), Ltd. We are informed that a company has just been registered for the purpose of acquiring the discoverers' and owners' claims of the Town Lands of Schweizer Reneke. The capital is £16,000, with a reserve of £3,000, and £2,000 has been put up for working capital. A great deal of prospecting has been done prior to the concern being put into a limited liability company. It is understood that the results have proved the existence of a very wide and rich deposit, whilst the diamonds found have realised excellent prices. The directors are Mr. Thos. Greig, of National Bank Buildings; Mr. Harry Filmer, of Corporation Buildings; Mr. Tom Bell, of Johannesburg and Bloemhof. Manager, Mr. W. Murray. All the shares of the company allotted for working capital having been applied for, no shares are offered for public subscription.

* * * *

The Last of the Treasury. The permanent closing down of the Treasury mine on account of the small amount of pay ore remaining in the property, which was precipitated by the late strike, serves to direct attention to the past history of this proposition. It may be recalled that there was a subsidence in the western portion of the property—mid 1905—and subsequent flooding of lower levels interfered with working. Further subsidence was reported in respect of 1906-7. In October, 1910,. an agreement was entered into between the Treasury and the Jumpers Companies, whereby the Treasury 60-stamp mill was purchased by the Jumpers Gold Mining Company; Treasury ore to be mined and treated by the Jumpers Gold Mining Company, the Treasury Company to receive one-third of the net profits derived from the joint working of the two mines to an aggregate of £53,500.

* * * *

The Ebenezer Mine. We wish to direct attention to a Government notice appearing in our advertisement columns regarding the Ebenezer mine. The Government is prepared to receive tenders for the lease of the exclusive right to mine for precious stones on the whole of this property, in extent 790 claims. The consideration to be quoted by the applicant as payable to the Government shall take the form of a monthly licence fee for each claim.

* * * *

Frank Smith Diamonds. The local secretary of the Frank Smith Diamond Estates and Exploration Company, Limited, advises that the following cable message has this week been despatched to the London office of the company: T. G. McLelland reports alterations to machinery resulted in great improvements yield. Wash from 8th July to 14th July inclusive 4,926 loads, yielded 283 carats.

* * * *

Sabie Activity. Recent development on the property of the Glynn's Pretoria-Lydenburg Syndicate at Sabie has disclosed a tonnage of 22,500 tons of ore, assaying 9·5 dwts. over an average width of 32·3 inches of reef. This is a highly satisfactory result, and the more so as it proves the existence of a payable reef within thirty feet of the boundary common to this syndicate and Glynn's Lydenburg Gold Mining Company, and adjacent to the werf section of the latter company. During the past few weeks Glynn's Lydenburg Company has been sinking two shafts on this boundary and very shortly should strike the reef. The existence and payability of this reef (known as Glynn's) being now satisfactorily proved up to the boundary in this particular section of their property, Glynn's Lydenburg shareholders have every reason for feeling more hopeful than they have of late, and this news should go far towards restoring the waning confidence in their property, giving them, as it does, the prospect of a new lease of life to that company. The new concern (Glynn's Pretoria-Lydenburg Syndicate) has just erected a 10-stamp mill of 1,250 lb. stamps and equipment for dealing with the slimes and tailings in the most up-to-date manner. By the end of the present month the mill will be started up and a substantial contribution to the gold output of this district may be expected by tho end of August. Now that the railway is nearly completed to Sabie a great development of the mineral resources of this part of Lydenburg may be looked forward to, and when the serious attention of the mining world is directed towards this district and a little of the study which hitherto has been applied to the gold fields elsewhere in South Africa is applied to the mining problem here, there is little doubt that the results will well repay the labour. With a healthy climate, cheap and quick railway transport from the coast, ideal mining conditions, low working costs, and the absence of miners' phthisis, surely such factors must tell in favour of these fields.

* * * *

A Rhodesian Mine and a New Copper Process.

Details of the "new process" by which tributors hope to work the comparatively low grade cupriferous ore in the Alaska mine, Mashonaland, at a profit will be received with much interest. The Alaska mine is now the property of the South African Copper Trust, Ltd., and some little while ago the board was approached with a view to tributing the ore bodies in the property down to water level. There is a large body of ore already proved approximating 200,000 tons and containing 3 per cent. of metal. The tributors propose to work this ore by a novel method and very naturally considerable attention will be paid to their endeavours. Should they prove successful, a new outlook might be developed for a number of other low grade copper ventures in the Union and in Southern and Northern Rhodesia.

* * * *

Developments at the Shamva.

As the Shamva mine, in the Abercorn district of Mashonaland, is expected to commence milling operations within the next few months, attention is again directed towards this proposition which promises to become the leading gold mine of Southern Rhodesia next year. The report just issued gives the position of the mine at the four levels opened upon. The 3rd level in October last was reported as having a length on the strike of 800 feet; subsequent cross-cuts, however, it is stated, have not allowed the inclusion of all this length, and as now the level is completed it is returned as 410 feet in length. Some winzing operations below the 3rd level have been effected, but the 4th level has not yet been opened upon. The amount of work done in the year was less than in the preceding year, partly as a consequence of transferring labour from development operations to the erection of plant. The ore reserves contrast as under:—June 30, 1910, 708,838 tons; "reduced" average value, 15s. 10d. March 31, 1911, 1,019,133 tons; "reduced" average value, 15s. 10d. March 31, 1912, 2,091,859 tons; "reduced" average value, 21s. 0d. March 31, 1913, 2,319,752 tons; "reduced" average value, 21s. 3d. It will be borne in mind that the company did not obtain the facilities of transport until the completion of the railway late in April, 1913. The mill being erected is to have a capacity of 40,000 to 50,000 tons a month, and is expected to be in operation by the end of this or the beginning of next year. The consulting engineer some while ago reckoned that after the railway was completed the working costs of the mine would be about 8s. 6d. per ton, this including 1s. per ton for redemption of development.

* * * *

Village Main.

For the year 1912 the realised net profit from operations of the Village Main Reef amounted to £443,176, to which must be added the amount brought forward, making a balance at the credit of appropriation account of £707,460. Dividends Nos. 23 and 24 of 7s. each, free of tax, have been paid, leaving a balance of £377,240 to be carried forward. The directors recommend that an interim dividend at the rate of 7s. per share, free of tax, be declared payable to all shareholders registered on the books of the company on June 30 and to the holders of coupon No. 24. The capital account has now been closed. During the year the company increased its holding in the Village Deep, Limited, by purchasing 17,352 shares, bringing the company's total holding on December 31, 1912, up to 87,352 shares. The consulting engineer's report states that the payable ore reserves amount to 1,683,066 tons, valued at 33s. 7d. per ton. The year's working profits were the largest earned in the history of the company. The life of the mine, based on the present ore reserves and covering the small area yet to be opened up, is nearly four years. A reduction in profits during the last three years must naturally follow.

* * * *

Montrose Diamonds.

The secretary of the Montrose Diamond Mining Company, Limited, has issued the following circular to the shareholders:—Mr. Percy Marsden, who has returned to England after his visit to the property, spent several months in South Africa, and during that time occupied himself exclusively with the affairs of the company, watching the progress of the work, conferring with the manager as to the development of the mines, the purchase and installation of suitable machinery and plant, and in assuring himself that the policy of the Board, in regard to the scheme of operations and general management, was being efficiently and economically pursued. He realised, however, that it was extremely important in the interests of the company, and especially in view of the largely determinative character which the mining operations had attained, to make an arrangement with a responsible diamond mining firm to take over the local management and to superintend the development, test washings, and general mining operations. With the sanction of the Board, negotiations were accordingly opened by Mr. Marsden with Messrs. Lewis and Marks, who thereupon took steps to have the mines thoroughly examined in order to satisfy themselves of the prospects of the thorough and systematic development which was being carried out. Mr. Fox, their chief consulting engineer, visited the property on several occasions, minutely inspected the workings, took a large number of samples of the blue ground developed, and reviewed in detail the whole of the operations. The property was also visited by two members of the firm. The result of these inspections satisfied Messrs. Lewis and Marks that the company possessed in its farm Wryneb an asset which, by the efficient development of its heavily mineralised blue ground should prove of great value.

* * * *

Liebigs in Rhodesia.

The leasing by the Chartered Company of 1,200,000 acres of ranching land in Southern Rhodesia to the Liebig Company at the low rental of 1s. an acre has given rise to further questions in Parliament. There appears to be some apprehension that the natives will, under the arrangement, be reduced to a condition something like slavery. There is, however, apparently no reason to anticipate that that will be the case. On the other hand, one of the conditions under which the Liebig Company acquires the land is that it will undertake to spend a considerable amount of capital in developing and stocking it with cattle.

* * * *

Recording Mine Accidents.

Recent publications of the U.S. Bureau of Mines show that, contrary to general opinion, the percentage of accidents in metal is greater than in coal mines. Some astonishing differences are shown between the several metal mining districts in number of non-fatal accidents reported. This, however, is largely, if not wholly, due to the various systems of recording accidents. Some companies make a record of practically every accident, however slight, while others record only the more serious accidents. Comparison is therefore, unfair to those such as the mines of the Rand which keep the most careful records, and these are generally the companies which take best care of their men.

* * * *

The Fourth Report of the Explosions In Mines Committee.

The fourth report of the Explosions in Mines Committee has been issued in London. The report is full of interest, and it affords a glimpse of the romantic field in which the Explosions in Mines Committee are working. In the case of the man in the street, " coal dust raised as a cloud in air " does not make any powerful appeal to the imagination, but to the scientific mind it presents a wonderful picture. The report tells us that the space occupied by a coal dust particle with a diameter of 1-1000 mm. (·000039 in) is 27,000 million times greater than that computed to be occupied by a single molecule of oxygen; and the estimated mean speed of an oxygen molecule, at ordinary temperature and pressure, is 425 m. (465 yards) per second. Taking hailstones with a diameter of, say, ¼ in., a coal dust particle, in an apparently still atmosphere of oxygen, might be compared to a spherical balloon 62½ ft. in diameter lashed by hailstones moving with a velocity of about 16 miles per minute. The enormous difference in size between the most minute coal dust particle and a particle of oxygen makes it extremely difficult to compare the phenomena that occur during the explosive combustion of mixtures of coal dust and air, and the explosive combustion of purely gaseous mixtures. Nevertheless, the Committee believe that coal dust, when suspended in a sufficiently finely-divided state in air, acts somewhat like a "coarse" gas, the aggregate of molecules contained in the one particle of dust corresponding to the single molecule that takes part in an explosion of a combustible gas and air, the heat energy necessary for propagation of explosion being derived from combustion of each dust particle as a whole without any appreciable preliminary distillation of gas therefrom. According to this view, any finely-divided dust that is capable of being burnt is capable of propagating explosion. This view of the matter explains why the explosibility of a particular coal dust does not entirely, or even necessarily depend upon the amount of volatile matter which it contains. As to the difference between the phenomena of inflammation and explosive combustion which is observable in the case of coal dust explosions, the Committee are of opinion that in the former case the flame is propagated (at all events with bituminous coals) largely by the burning of gases distilled from the dust, whereas during explosive combustion the portion of each dust particle that aids in propagating the flame is burned as a whole, both the volatile matter and the fixed carbon being consumed. The greater part of the fourth report is devoted to giving the results of experiments on the effects upon the progressive development of a coal dust explosion due to obstructions placed in its path as it travels along a gallery. These experiments were performed by Dr. Wheeler about three years ago in the Altofts Gallery for the Mining Association of Great Britain. The progressive effect of making one, two and three constrictions in an originally smooth gallery is very striking. In one series of experiments made under similar conditions, the maximum pressure developed by an explosion in a clear gallery was 16 lbs. per square inch, whilst with three constrictions the pressure rose to 152 lbs. per square inch.

* * * *

Use of Steel Points for Core-Drilling.

M. L. Martel, in an article that is appearing in the Bulletin de l'Industrie Minerale, furnishes an interesting account of the use of steel-pointed drills. The recent application of granules of steel instead of diamonds has shown that in many instances they offer advantages over old methods of boring. The principal advantage of steel granules is in the matter of cost, facility in obtaining bores of large diameter, and boring very hard rocks—such as corundum. It is in hard, broken rock that this method of drilling displays its superiority over the diamond drill. The difficulty with steel-pointed drills appears when the boreholes are far removed from verticality. Under favourable conditions the granules have penetrated 52 ft. in 24 hours, but generally, in ordinary ground and moderate depth, the daily advance is from 16 to 20 ft. This mode of boring seems destined to be extensively employed.

* * * *

Modder Deep Levels: A Correction.

In our last issue an error crept into a note under the heading of "Modder Deep," in which we dealt with the operations of the Modderfontein Deep Levels Company during the quarter ended June 30th last. In connection with development it was stated: "The balance of 7,042 feet assays 7·9 dwts. per ton over 40·8 ins." This should read "7·9 dwts. per ton over 48 ins." We further regret that through an error the official paragraph, instead of stopping at the words "certain extent," was followed by certain statements as to pumping capacity which were not contained in the quarterly report forwarded to us for publication.

TOPICS OF THE WEEK.

THE OUTLOOK.

The outlook for the Rand, for, indeed, the whole country, at the moment of writing seems extraordinarily black. Never since the momentous hours before the outbreak of war in 1899 has South Africa been faced with such a cataclysm as now seems pending. The demands of the Transvaal Miners' Association and of the Railwaymen's Union are available as we go to Press, and the former are printed elsewhere in this issue. Some of these are moderate enough, but others cannot fail to be found preposterously extravagant. If the fears be realized, that a hasty and unreasonable attitude may be adopted by the Unions in pressing the worst of these demands, then it is appalling to contemplate the possible consequences that may result. If a general strike be precipitated, the natives now on the Rand must at once be sent back to their kraals. The effect on the re-starting of work at some date sooner or later will be similar to that caused by flooding the mines. The white workers will be burning their boats behind them, and the consequences no one cares to contemplate. Every friend of the workers and of the country can only at this crisis beg them to pause and think. Throughout the country there are grave signs of native disaffection. A cruel strain has been placed upon the nerves of the womenfolk in the towns and on the Reef. Even with best intentions the labour leaders cannot hope to restrain all acts of violence among their followers that may result from another strike. Anarchy, civil war and chaos are courted by lack of thought at this juncture. It is to be hoped that the leaders recognise it. Let us not be misunderstood. The formulation of their demands and statement of their grievances by the men is as it should be. Nor is the fact that the men should ask for a great deal more than they expect to get very surprising. Human nature is built that way. But if the framers of these demands refuse to wait to have their effects, immediate and remote, on the whole economic fabric of the country dispassionately examined before Government is called upon for a "Yes" or "No," then upon them will lie the responsibility for all that may follow. We come too closely into daily personal contact with the miner and railwayman on the Rand not to have the highest respect for their many excellent qualities. Nor are they badly led—though it was disappointing to find no official repudiation of the worst offences against order during the recent trouble. But no one can say what may be the exact effects on a highly organised industry of a series of demands framed by idealists with their eyes on an industrial millennium. Apparently it is no use telling the men that certain demands entail the closing down of a certain number of mines on the Rand. They flatly refuse to believe it, and, while facts and figures are being marshalled to prove it to them, a crisis may be precipated. We are not in the counsels of the mineowners in regard to their plans at the present juncture. But no student of Rand economics can fail to see at a glance the disastrous effects of attempting in a hurry to apply the principal of collective bargaining and the minimum wage to their delicate and peculiar problems. Without lengthy and careful investigation, the result must be ruin and confusion. As we have said, the outlook at the moment is extremely black, though it is not too late to hope that counsels of wisdom and understanding will prevail.

POSITION OF THE ALBU MINES.

In the general consternation caused by the strike, the proceedings at the annual meeting of the General Mining and Finance Corporation passed almost unnoticed. In the absence of Sir George Albu, Mr. George Nathan presided, and exhaustively reviewed the position and prospects of the mines of the group. Having dealt with the general problems of the industry, including the recent strike, Mr. Nathan showed that the most serious feature of the present position is the extraordinary depression which has prevailed in financial circles during the past few years, not only as regards South African business, but of widespread influence. This has tended more than anything else to retard the development of the industry. To take the example of the General Mining and Finance Corporation, he said it had been compelled to advance to certain of its subsidiary companies, including the Roodepoort United, Aurora West, and Rand Collieries, capital aggregating over half a million pounds, or more than a quarter of the capital of the Corporation. Mr. Nathan dwelt upon the cramping effect of having such a huge sum tied up—a sum which in normal financial times could have been released long ago, and have afforded the Corporation an opportunity of extending its operations to other directions in which this money could have been advantageously used. He added that the operations of the producing mines of the Group for last month showed a general improvement, and it was therefore unfortunate that the spread of the strike should have occurred at a time when the properties were giving promise of better results for the future. From Mr. Nathan's summary of the position of the subsidiaries at date we learn that the Aurora West is making steady and substantial profits, and has ore reserves of good value and large quantity. The Meyer and Charlton and Van Ryn Companies are prosperous and in an excellent position generally, but an improvement is hoped for. In the case of the Roodepoort United, although an ultimate return to higher profits and a more satisfactory condition of affairs generally is expected, shareholders must exercise patience for the time being. As regards the Cinderella Consolidated there is the outstanding and hopeful feature that the record of the mine shows it to be capable of producing ore which under normal conditions of working would show highly satisfactory profits, and in this fact lies the encouragement to the Corporation to proceed determinedly with the task of justifying the large investment which it elected to take in this concern. Mr. Nathan declares that it will be the guiding policy of the Corporation to proceed unswervingly towards this end, and "if strenuous effort and the application of this huge undertaking of our long experience of gold mining on the Rand will enable it to grasp success, shareholders in a few years time should see another and brighter side of the picture." It is not necessary to go beyond the Albu Group to find examples of difficulties surmounted by perseverance and faith. Fifteen years ago the Van Ryn was apparently un unpayable proposition, and to-day the particular company is in a position of financial strength and prosperity equalled by few mining companies. To come to more recent times, it is only a year or two ago that the West Rand Consolidated was reckoned by some as a proposition in respect of which the ambitions of the Corporation seemed to have marched faster than its prospective value as a mine warranted. However, after many years of hard development work, which showed very little result at the time, as far as one can possibly judge from present indications, the West Rand Consolidated has emerged from its chrysalis stage, and a comparatively short period of further development operations should enable it to embark upon a considerable extension of its plant and join the ranks of the big mines of the world. In face of such examples as these, and many others in the history of the Rand, we agree with Mr. Nathan that "we should be failing in our duty if we lost hope in the Cinderella just because of what may be described as the present artificial factor of working costs, and I cannot emphasise too much the statement which has so often been made regarding this mine, that when the connection between the Western and Central sections shall have been completed the whole proposition will take on a different aspect. It will enable the property to be worked under normal conditions, such as are enjoyed by other mines on the Rand and if the large quantity of ore developed during the operation possesses the same value as that already produced by the Company, we shall be able to look back upon the present difficulties as we can now look back on the many difficulties overcome in the past." Referring to the Rand Collieries, another venture which has so far not justified the expectations held in regard to it when, with very fine borehole results to encourage it, the Corporation invested a large amount of capital in sinking the two shafts and carrying out an extensive scheme of

emphasis cannot be laid on the points brought out by Mr. development, Mr Nathan said: "In this work we were also encouraged by brilliant assay results in certain parts of the mine, but as regards the small portion of the property so far opened up, these values were not found to be consistent." Regarding the New Steyn Estate, he touched upon the potential value of the property as indicated by the results obtained by the producing companies whose mining areas lie immediately above. Of course Mr. Nathan's reasoned optimism has been overshadowed and eclipsed by the extraordinary course events have taken since he made his speech, but, it is to be hoped that normal conditons will shortly be restored and his predictions fulfilled.

THE TRUTH ABOUT PHTHISIS FIGURES.

Mr. George Nathan did a good and opportune service at the annual meeting of the General Mining and Finance Corporation the other day in drawing attention to a number of fallacies prevalent with regard to the extent of phthisis of the Rand. For instance, he showed that the Report of the Miners' Phthisis Board for the six months ended 31st January last had unfortunately created a considerably worse impression than was actually justified by facts—owing to the misinterpretation placed by many people on the statistics attached to the Report. While not desiring for a moment to gloss over the alarming extent to which miners have been attacked by the disease as instanced by the statistics in question: the number of cases is regrettably large—much more so than any one had reason to anticipate—the position is not so bad as has been indicated in many quarters through an unwitting misunderstanding of the figures. Mr. Nathan explained that in the first place, it must be remembered that in a large proportion of cases the disease was contracted in its earlier stages many years ago, and was for some time unrecognised by the men themselves, and for a still longer period by the mines, as the sufferers naturally did not wish to give up work whilst earning wages. After the coming into force of the Act, however, most of these accumulated cases came before the Phthisis Board practically at once, and from comments in the papers, both here and in Europe, quite a considerable number of people seem to be under the impression that a similar number of claims will be made each half-year. This, of course, is not correct, for the reasons stated. Moreover, it is confidently anticipated that, as a result of the precautionary measures now in practice in all mines on these fields, the incidence of the disease will be appreciably diminished—if not, indeed, eliminated altogether in the course of time. For instance, fans have been introduced to clear the workings of dust and smoke as quickly as possible: the hoisting of men to and from the surface has been so arranged as to expose them as little as possible to smoke and dust: during drilling operations the working faces are kept damped and the stopes watered, all broken rock in stopes, drives, etc., is watered to keep the dust down, and water sprays are in constant use in all air ways for the purpose of moistening the air and allaying dust. In fact, every effort is being made to counteract the prejudicial influences which have in the past contributed largely to the prevalence of the disease. In the statistics appearing in the Phthisis Board's Report, there is one point of importance which should not be overlooked—that the figures relating to the expectation of life refer only to the men who have actually claimed on the funds, and that no account whatever is taken of the large number of miners who have been for years, or still are, working in the mines, but who have not put in any claims and whose expectation of life is therefore presumably much higher than that of those who have claimed. In view of the prominence now being given to phthisis questions in the Imperial Parliament, too much Nathan.

THE RAND ON THE EVE OF THE CRISIS.

A Flying Survey of the Main Reef Mines—An Examination of Position and Prospects from Randfontein to Geduld.

Recent events have altogether obscured the intrinsic worth of the Witwatersrand gold field. The late strike and the present industrial unrest have sadly marred the normal development and profit-earning routine of the Reef and so great has been the upheaval that we should not be surprised to receive queries from oversea shareholders enquiring if the Randfontein Mines were still existent and whether New Modderfontein shares are worth par. The cloud that has fallen over the Main Reef series is so dense and the immediate future so enveloped in uncertainty that it is with difficulty one brings oneself to write again of the Rand as an industry and not a maelstrom of turbulent elements. As was remarked in these columns last week, the most encouraging fact that emerges from the debacle is that the mines and their equipments are still intact. Neither underground workings, ore reserves, nor plants, have suffered any damage and if for a few minutes one can unburden one's mind of all the calamitous events of the past few weeks it will be patent that the mines were never better able to prove their inherent strength and stability than at present. It may be argued that this is no time for a general stock-taking of the industry and there is much to be said for that view. Notwithstanding, it may be well to endeavour to allay public fears and anxiety to some extent by traversing the reef from west to east and briefly noting the positions of the several leading mines; if it be possible without reference to the incidence of labour troubles.

Randfontein, after years of patient striving and coalescence of various properties, signified the turning of the corner at the end of last year by the declaration of a first dividend. The second distribution announced a fortnight ago involves the payment of the large sum of £314,527 amongst shareholders. The company owns the largest gold milling plant in the world and ore reserves aggregating 7,600,000 tons of 6·2 dwts. per ton value were blocked out in the several mines at the end of the year. Costs have been reduced to a creditably low figure and despite the low average grade of the ore there is a good margin for profit under normal circumstances.

At the West Rand Consolidated the comprehensive scheme of development laid out some time ago for the expansion of operations on this large property of 1,908 Main Reef claims (715 of which also contain the Battery Reef series) made good progress last year, and the intention to enlarge the scope of development during the current year with the view of further, and appreciably, strengthening the position of the ore reserves has been carried into effect. The amount of development work effected on the Battery Reef has disclosed very satisfactory values, and indicates that this ore body will represent an important contributor to the prosperity of the mine.

The Luipaardsvlei Estate has been earning good profits on a recovery of a little over 5 dwts. per ton. At Roodepoort the old Durban Roodepoort property still continues to pay out dividends. The Durban Deep's position improved considerably last year, whilst at the other two properties—Princess Estate and Roodepoort United Main Reef—the development outlook is brighter. At the Bantjes Consolidated development is in a forward state and the company has entered the list of regular dividend payers. At the Aurora West it has been demonstrated that the main essentials of a successful mining proposition are present. The profits have steadily improved, and the improvement is being fully maintained: the ore reserves have appreciably increased, without any diminution in value, to an equivalent of more than three years' supply ahead of the mill; as regards the "life" of the mine, this is likely to be a long one. A scheme for liquidation of the company's liabilities would render this company able to pay fair dividends. The New Unified maintains its profit distributions and is in a generally sound position. The next door mine—the Main Reef West—has proved a disappointing proposition for some months past, but the prospect of improved development and a return to the dividend-paying list is far from being shorn of hope. The Consolidated Main Reef on the other hand appears to have bettered its position, whilst that of the sister mine has gone backwards. The Consolidated Langlaagte with a large tonnage of payable ore in reserve, and the fine new plant in operation was expected to enter the dividend list at the end of this year. At the Langlaagte Estate the ore reserves at March 31, 1913, are given as 1,315,725 tons. This company—one of the best known and most prolific dividend payers of the Rand—earned a profit of about £90,000 in the last half year and has declared a 7½ per cent. dividend.

Of the Crown Mines, the leading gold mining proposition of the world, it may be said that a position of unparalleled strength has been attained. Both underground and on the surface the separate mines and the different installations have been merged together so that they are steadily getting into a position in which they shall derive all the advantages that are to be gained from large scale production by one concern. At the end of last year payable ore reserves were estimated at 10,607,671 tons carrying gold of the value of 29s. 9d. per ton, as compared with 10,124,072 tons and 30s. 5d. in 1911, and 6,282,719 tons and 31s. 11d. in 1910. The Robinson may become merged in the Crown Mines, in which concern this company has a large holding. The mine has already paid out nearly ten millions in dividends, and the ore remaining in the property will greatly augment this vast total. At the Robinson Deep, although much of the ground is of a treacherous nature, the company should under ordinary conditions be able to maintain distributions of 15 per cent. each six months. A re-estimation of the ore reserves shows that at 31st March last the fully developed payable ore amounted to 1,538,000 mine tons of an average grade of 6·0 dwts., and, in addition, there were some 346,000 mine tons of partially developed ore of an indicated average mine grade of 5·88 dwts. per ton. The actual value per ton of the ore reserves remains about the same as reported last year, but it is considered more reliable to record the tonnage and value over a stoping width, as above, than over a milling width as formerly. The Ferreira Deep mine has been got into a sound working state again and the ore reserves are over two years ahead of milling requirements. Development continues to expose conglomerate of high assay value. The Village Main Reef, although it has entered on the last few years of its life, continues to pay out dividends of 70 per cent. per annum. At the Village Deep advantage has been taken this year of the satisfactory labour position to push development generally, and 9,270 feet of development have been accomplished up to the end of April. This has had the effect of further increasing the amount of blocked out ore in reserve. The Main Reef Leader is continuing to open out satisfactorily; all the ore valued this year has been payable, but so far the average is, if anything, slightly lower than that of the ore valued last year. On the South Reef there have been further encouraging results. Profits have averaged about £24,000 per month. The City and Suburban will benefit by purchase of claims from the City Deep. The underground conditions of the City Deep will continue to improve, and the increase in the number of stope faces should be rapid after the conclusion of this year. Within eighteen months or so the mine should be in a very strong position in every respect and capable of crushing a very large tonnage under favourable conditions. The proposed sale of 15 claims will materially strengthen the cash position of the company, and the bulk of net working profits will be available for distribution to shareholders in the form of half-yearly dividends. A dividend of 10 per cent., or 2s. per share, was declared for the half-year ending the 30th June. The Meyer and Charlton is in a most satisfactory position. Last year the gross profit (including sundry revenue) of

£200,387 was approximately £63,400 higher than the previous record of £137,000 for the year 1906, and is due to the excellent average recovery value of 42s. 6d. per ton milled during the year, which was only exceeded by one other mining company on these fields, and which is the highest yield in the case of this mine since 1895. Regarding the operations of the mine since the close of the past financial year, the previous level of profits has been more than maintained, as the declared working profits for the four completed months to April 30 of the current year have averaged over £20,000 per month. The Wolhuter's position must be adjudged satisfactory. The mine has a considerable number of years of life before it, and under normal conditions the present dividend rate should at least be maintained. The New Goch's recent results have fallen short of anticipations, but development has been pushed ahead with favourable results and profits should shortly be augmented through treatment of old slimes. The Nourse Mines may be regarded as a consistent dividend payer for a number of years to come; and the New Heriot, with reserves nearly four years ahead of the mill and a small capital, constitutes an attractive investment. The Geldenhuis Deep, after a period of unsatisfactory results, shows visible signs of improvement. Payable reserves are slightly over two years in excess of mill requirements. The Simmer and Jack, with 320 stamps at work, has paid out 7½ per cent. on a capital of £3,000,000 for the past 3½ years. The underground condition, both in regard to development and stope faces, is satisfactory. The two sister deep levels, Jupiter and Simmer Deep, have been battling with difficulties for some years past. The former has recently earned fair profits, but the fact that the Simmer Deep has proved one of the most disappointing mines on the entire reef unfortunately admits of little dispute. Both the Ginsberg and Glencairn, considering their comparatively small equipments and in the case of the latter the very low grade of ore worked, are earning good profits. The outstanding feature on the New Primrose mine has been the steady reduction in working costs, which last year were 1s. per ton lower than the previous year. There has been a further slight reduction in working costs during 1913, and the average monthly profit for this period is higher than that for 1912. At the Rose Deep record progress has been made, the success of the amalgamation policy has been fully demonstrated, and the last dividend recorded an increase. The Knights Deep recently started up its new and re-organised metallurgical plant. In April working costs were only half a guinea per ton, the rate of profit being just over 1 dwt., say, 4s. 5d. per ton. But even this on the huge tonnage of 104,800 means no less thán £23,000, of which 2-15ths accrues to the Consolidated Gold Fields in terms of the agreement. Profits of the "Knights," or Witwatersrand, mine have been on the upward grade for some considerable time past. The "Knights" mine, whilst it has been a consistent producer and dividend payer for many years past, has still a long lease of life before it in regard to the southern portion of the area. The bottom portion of this T piece has on exploitation given very satisfactory results and with the new plant in operation and encumbrances to the payment of representative dividends removed shareholders should soon be in receipt of substantially larger distributions than heretofore. In spite of all the difficulties that had to be surmounted the ore reserves of the Witwatersrand Deep showed an increase of 56,055 tons as at the end of last year, and the quarterly report for the quarter which ended on the 31st March last shows the ore reserves as at that date as 1,515,578 tons at 6·9 dwts. over 50 inches, as compared with 1,492,257 tons at 6·83 dwts. over 50 inches at the 31st December last. The actual development figures for the quarter just mentioned show that of 3,378 feet of reef 2,973 feet had been sampled, and that 2,703 feet, or 90 per cent., averaged 10·37 dwts. over 10 inches. At the last annual meeting increased dividends were foreshadowed. At the Knight Central a cautious policy has prevailed and funds have been husbanded for development. Prospects to the south of the Simmer dyke are considered good. At the end of 1912 the cash position of the East Rand Proprietary was sound and improving, the ore reserves below those of 1911, but the mining position, on the whole, healthier. Owing to the contractors' delay the pumping plant for the western section is still undelivered, and may be delayed till late this year. Its advent, in the light of the better results from the Wit. Deep below the dyke, promises well for the opening up of the western or Driefontein section of the property. The latest development results are moderately satisfactory, though in no way conclusive. Generally speaking, the development exposures for the first four months of the present year are on a par with those obtained for 1912. At the Cinderella Consolidated the mine has been working on a cramped basis and securing such poor results that the mill was closed down some little while ago and energies concentrated on development. The New Kleinfontein has been under a cloud, but the mine is capable of earning substantial profits and the life in actual practice is likely to substantially exceed general expectations. The adjacent property, the Van Ryn, is in a particularly strong position and was recently able to increase its dividend payment. Brakpan has successfully negotiated the worst of its stope subsidence difficulties. The mine has been gradually getting into its stride again, has a strong ore reserve position, and is paying out 40 per cent. per annum. New Modderfontein profits in May were at the rate of £576,000 per annum, there being milled 52,250 tons for a total recovery of 23,247 ounces, with costs at 19s. 3d. per ton. As we have often remarked, few propositions possess such potentialities as this, and it is certain that within the next few years the profits of this mine will be very largely increased. With a wise conservatism, the board of management is awaiting developments over a considerable stretch of reef in the huge and practically unexplored eastern section of the mine (the section which the new central shaft is designed to attack) before giving effect to any policy of expansion in regard to reduction operations. This at any rate is the interpretation we put upon the remarks made by Mr. F. Eckstein at the Central Mining and Investment Corporation meeting. At the Modder B. there has been proved a large and rich mine in the western portion of the property. The latest developments in the west give no reason to expect a fall in profits as compared with last year. There is no doubt that the general outlook is very bright, and the mine's development position should soon justify an increase in equipment. Geduld recently completed its new plant, and the prospect here is a good one. The same remark applies to the Van Ryn Deep where a brand new 80-stamp plus tube mills equipment has just been completed and the reserves are of remarkably high value. Of the Modder Deep Levels, Government Mining Areas, and other developing propositions on the Further East Rand, it may safely be said that their present day positions augur well for excellent returns in the near future.

Taking all these facts and figures into account, there is surely every justification for the statement that the Rand's gold mines in so far as mining positions and technique are concerned were never in a sounder position than at present. Whether the stability and value of the several propositions discussed above is to be fully realised and translated into cash which will filter through every section of the community during the next year or two, or whether this realisation is to be indefinitely postponed, the events of the next few weeks will have to answer.

Mr. D. J. van Niekerk, of Paarl, has just returned from a visit to the River Diggings, where he has been investigating various methods. In conversation with a *Diamond Fields Advertiser* representative, he said that from his observations he concluded that both the Church and the State neglected the inhabitants. "It is time," he said, "that the latter should assist the thousands of poor diggers working along the river. The diggers are in most cases the poorest people of all nationalities, who, having nothing to do, have run to the river diggings to make a living in the best possible way they can. They are living mostly in tents and movable houses. They have taken out claims at 5s. per month each claim, and 2s. 6d. monthly for a prospecting licence. They are getting claims from the New Vaal River Estate on more reasonable terms than from the Government, and are able to work on a much larger scale. The diggers are living in the little towns along the river, and there are hotels and stores, but very few other substantial houses. The thousands of poor diggers are paying the Government, by way of claim licences, etc., about £50,000 annually, for which they get very little in return. This is due largely to the fact that they are always moving about from one place to another; they are, therefore, like the proverbial rolling stone which gathers no moss."

PROGRESS IN GOLD MINING AND MILLING.

A Critical Review—The Era of Production on a Large Scale—Probabilities of the Future.

A remarkably interesting and comprehensive paper entitled "Notes on the Mining and Treatment of Gold Ores," appeared in a recent issue of the *Canadian Mining Journal*. The author, Mr. R. B. Lamb, in the course of his thoughtful contribution, makes a number of novel points, and whilst Mr. Lamb's remarks are principally confined to America and Australia, he has one or two things to say about the Witwatersrand. It is always worth while recording the impressions of an engineer whose life work has been expended on mining fields other than those of this country, and it is also worth while to note the things that appeal to him most in regard to the Witwatersrand. Moreover, Mr. Lamb's views of gold mining and milling in general, and particularly his anticipations of probable developments in the course of the next few years are of decided interest. In the paper the author attempts to discuss broadly mining methods and metallurgical processes employed for the extraction and treatment of gold ores during recent years and to indicate some probable lines of progress in the immediate future. Mr. Lamb evidently thinks that the prospect of a future large annual output of gold from gravels, placers and deep leads is a poor one. "The production of gold from vein mining, on the other hand," he writes, "has been steadily increasing during the past ten years, and for the year 1912 we have the largest production from vein mining on record. This has been due to several causes. A large factor is the discovery and intensive exploitation of the deposits of the Transvaal. The real cause, however, appears to me to be that many deposits are of such nature that in order to return an adequate profit on the capital invested, operation on a large scale is compulsory. We have before us the evidence of a number of years of gold mining, showing that the early vein discoveries of importance were comparatively rich in gold and of limited tonnage. These were easily worked with small plant and little capital was required to return big profits on the investment. As the rich veins which were easily found (such as those of Australia and California) became worked out larger deposits of lower gold tenor were developed and brought to the producing stage; hence, large combinations of capital involving greater development ahead of reduction processes became the practice. The development of a gold prospect, where a small amount of capital will put it on a producing and profitable basis and where the mine can be further exploited and tonnage and production increased out of profits, is a rare occurrence now. More comprehensive study and greater development with a view to blocking out tonnage ahead of a proposed reduction plant are essential factors in present day gold mining. It is becoming increasingly more difficult to mine in a small way. Capital is not attracted by small tonnage."

Mr. Lamb goes on to pay a tribute to Rand mining methods:—"The Rand, on account of the depth and extent of its ore deposits, taught the mining world much in the way of handling ore and developing and blocking out ore reserves far in advance of milling operations. While attending to this problem the Transvaal rested content with the metallurgy of gold as worked out by earlier practitioners, and it was not until Kalgoorlie had demonstrated the value of more progressive methods that the Rand began to adopt these measures." Like many other oversea critics, Mr. Lamb seems to think that the Transvaal has played a very small part in metallurgical development. He continues:—"The dawn of modern methods began in Australia with the treatment of immense heaps of tailing accumulated from the mills of the fifties, sixties and seventies. Eastern Australia with its tailing heaps developed the chemical side of metallurgy and Western Australia with its desert difficulties developed the mechanical side of metallurgy. The result was a highly efficient body of trained men. These men were available for other service as soon as the great tailing heaps had disappeared. Most of these accumulated tailings of Eastern Australia carried a considerable portion of sulphides which were oxidized by exposure to the air and complicated chemical salts resulted from weathering. To obtain the solution of the gold by cyanide before its destruction by the salts of iron and to do this at a low cost, sharpened the minds of those in charge and was responsible for an evolution that those engaged in the work look back upon with the fondest recollections." Mr. Lamb appears to lose sight of the fact that the Transvaal gave birth to the cyanide process and that the Rand has evolved a system of general treatment second to none in the world. Great credit, too, is due to Rand metallurgists for the excellent work they have achieved during recent years in regard to classification. In conclusion, we quote Mr. Lamb's vision of the developments that are likely to come to pass in gold mining and treatment during the next few years:—We have arrived at a state of mine equipment that would astound the forty-niner, and we are triumphantly marching to a metallurgical goal that a few years ago was not contemplated. We are evolving the continuous treatment process, and few yet realize what this means for the future. An ideal process would be one which could treat ore without men and without supplies. We have not eliminated all the men yet, but they have been reduced over 50 per cent. in the past ten years. The consumption of supplies also has correspondingly diminished. There is no doubt that the metallurgical chemist will succeed in further reducing the present consumption of material. In this brief review it is impossible to allude specifically to the splendid work that has been done in the various modifications of the cyanide process, and to enumerate and describe the different appliances that have been brought together to affect this evolution. It is unnecessary to describe the mining systems in use throughout the world for the extraction of gold ores, but the time is not far distant when we will have done with the stamp mill and all machines depending on the close application of an individual for their successful operation. We will simplify mills as we have simplified and improved underground systems. We will treat ore more cheaply than now, with fewer wheels and with less complication. Only recently we have witnessed the application of machinery to underground systems, the improvement of stoping methods, and the elimination of much physical drudgery. The wet treatment of refractory ores has been successfully accomplished. We are now facing simplification of plant design.

British Central Africa Co.

The profit and loss account for the year ended June 30, 1912, shows a profit of £33,379, including interest due on Shire Highlands Railway debentures, which sum, added to the amount brought forward from the previous year—namely, £53,100—has been carried forward. The Shire Highlands Railway, Nyasaland, Ltd., has again experienced a prosperous year, the gross receipts having increased from £26,866 in 1911 to £31,640. Negotiations with the Colonial Office regarding the subsidy lands due to the company for making the Shire Highlands Railway and regarding the extension of that line to the Zambesi have been in progress during, but had not been completed at the expiry of, the year under report. The cotton and tobacco plantations gave a very fair crop, which would, however, have been heavier had they not been affected by the drought at the beginning of the year. The store trade has been satisfactory, having regard to the famine which prevailed in Nyasaland at the latter end of the period under review.

The aggregate value of the 387 representative securities selected by the *Banker's Magazine* for the purpose of statistical comparison showed on Friday, June 20, a fall of 88 millions, or 2½ per cent., as compared with the figures of May 20. This marked the lowest point touched during the last seven years, but a lower level still was reached on the following Saturday and Monday, and Consols at 72¾ were only ⅜ above the lowest price touched last year.

STARTING SMELTING OPERATIONS AT MESSINA.

Progress of Construction Work—Favourable Underground Developments—The June Output a Record—Rail Head at Liliput.

Events of the greatest importance to the base metal industry of the Transvaal are now taking place in the extreme northern portion of this Province, and in the immediate neighbourhood of the Limpopo River. In this area the Messina (Transvaal) Development Company, Ltd., has been operating for a number of years past, and although handicapped by transport and other difficulties the property has produced considerable quantities of copper ore of thoroughly satisfactory value.

History of the Concern in Brief.

Preliminary exploitation of the lenticular cupriferous deposits of Messina commenced shortly after the end of the Boer War, and so satisfactory were the results secured that early in 1905 a company was formed with a capital of a quarter of a million to acquire and work the farms Berkenrode, Vogelzang, Tempelhof and Maryland. At first ore was roughly sorted by hand, but in 1909 a concentration plant commenced operations, and there was a consequent substantial increase in output. From the end of June, 1906, and up to the middle of last year the Messina Company mined 76,135 tons of ore and produced 10,861 tons of concentrates of an average assay value of 52·7 per cent. copper. Productive work has of recent months been restricted, and energies concentrated on development and construction of additional plant in anticipation of the continuation of the railway from Pietersburg to the Limpopo. The line has now been extended almost to the mine and the company is taking advantage of the facilities provided by the administration and the nearness of rail head to the property. Plant and supplies are being hurried up and ore despatched.

The Lower Grade Policy.

The shipment for June—462½ tons of concentrates, containing on the average about 40 per cent. of copper—constitutes a record for the mine, and it should be noted that this result was obtained with the old mill of comparatively small capacity. A word regarding the grade of concentrates produced may here be in place. An examination of shipments during different periods reveals the fact that there has been a steady diminution in metallic contents per ton since 1906. Thus in that year the average assay of the 280 tons of concentrates produced was 66 per cent. In the next twelve months—from July, 1906, to the end of June, 1907—the value was 60·66 per cent. The next year the value had fallen to 58·3 per cent. and in the next period it was 52·3 per cent. This decline in grade has continued, and is, of course, due to ability to work ores of lower assay value as the years have gone by and the mine and its equipment have become established. In the earlier days of the proposition only the very highest grade ore was picked out by hand and despatched to Pietersburg on donkey wagons. Lower grade rock which can to-day be worked at a profit could only be shipped at a loss under the primitive conditions obtaining at the mine a few years ago. With railway facilities near the mine costs are naturally reduced and the company can thus earn substantial profits from ore hitherto regarded as unpayable. With the new concentrator plant at work the basis of production will be very largely augmented and this will tend towards still further economy in operating expenses. The management hope to permanently increase the production almost right away, and it is at least certain that before many months have elapsed the Messina will be a very much more important producer than it has been so far.

The Smelter and Concentration Equipments.

Special mention must be made of the fact that smelting operations—the first carried out in the Transvaal on anything approaching a large scale—are now about to commence. As a fact, it is expected to start smelting within the next few days. One reverberatory furnace has been erected and the other should be ready by the end of this month. With these in operation the output will be augmented to the extent of about 150 tons of copper matte containing close on 50 per cent. of metal per month. Preliminary tests have shown that the method of reverberatory smelting adopted is entirely suited to the class of ore it is proposed to treat, and in a short time the company contemplates adding to the metallurgical plant of the mine a roasting and refining furnace for treatment of matte with a view to shipping blister copper. Good deposits of lime have been found in the neighbourhood and with coal close at hand (the company has acquired a coal area about 25 miles south-west of Messina, but it should be understood that the product whilst satisfactory from a steaming point of view, has yet to be thoroughly tested in so far as its smelting value is concerned), the company may be said to be in a good position to carry out smelting operations on a large scale. Construction work is proceeding rapidly and the new 250-ton concentrator plant is nearing completion, also an electric pumping plant designed to give an adequate supply of water for the increased milling plant. Mine development is proceeding favourably and the 9th level has just been opened showing the ore to be of good average value. The new three-compartment shaft is down to the seventh level and will be sunk to 1,000 feet (the tenth level). A new winding engine is being erected with capacity for at least 2,000 feet.

The Railway Position.

As to the railway, excellent progress has been made of late. From Louis Trichard the line is still in the hands of the construction department, but rail head has been advanced to the Zand River, within 20 miles of the mine. The station here is named "Liliput." A bridge has been constructed across the Zand River, and beyond to the mine the route is ready for plate laying. The line is expected to reach Messina about the end of October next. Meanwhile the Messina Company are availing themselves of the facilities given by the administration and are sending up supplies to and transporting ore from Liliput. A very fine piece of engineering work has carried the line through the Zand River Poort and over the Zoutpansberg mountains. Notwithstanding delays and sickness during the rains, very good progress has been achieved.

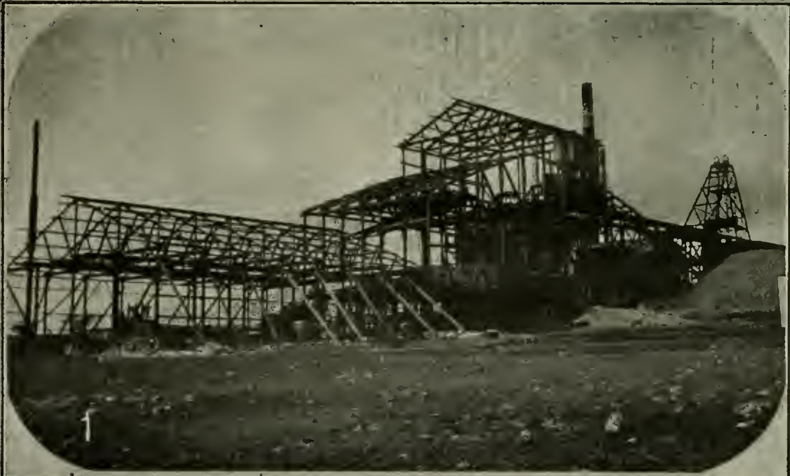
A Bright Outlook.

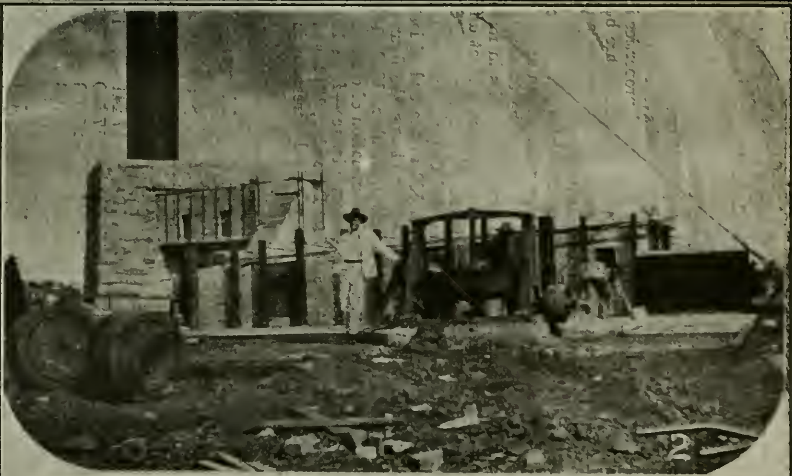
Altogether, then, it may be said that a new epoch has begun for this Northern Transvaal base metal proposition, and it cannot be denied that the epoch has all the appearance of being a thoroughly bright and satisfactory one. For the excellent photographs accompanying this article and which illustrate the progress of construction work at the mine and on the railway, we are indebted to Mr. J. M. Calderwood, M.I.M.M., the company's consulting engineer, and to whose untiring efforts the present excellent position at the property is largely due.

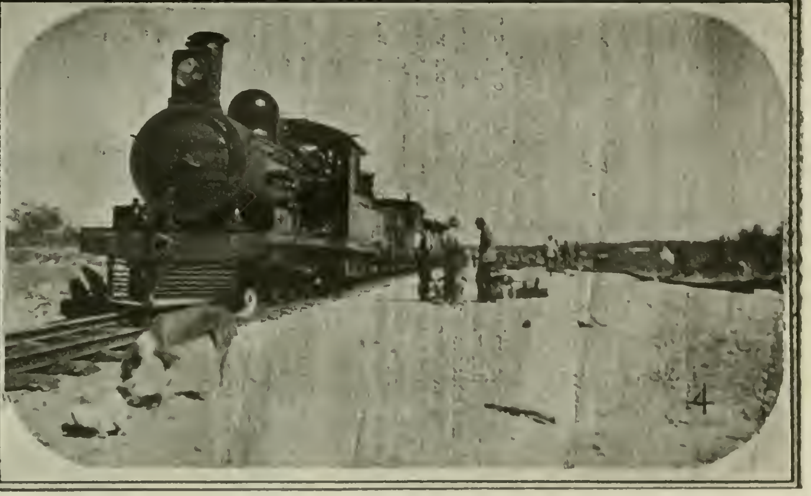
Indwe Collieries.

The nineteenth annual general meeting of the Indwe Railway. Collieries and Land Co., Ltd., was held in the board-room at Indwe recently. Mr. A. Everitt (chairman), in moving the adoption of the annual report and balance-sheet, said that it was with great regret that he had again to put before them such an unsatisfactory balance-sheet. The output had been 3,902 tons less than the previous year, and there was a decrease in the revenue of £3,434. This decreased output was attributable to various causes, and was dealt with very fully in the mine manager's report. Owing to the decreased output and consequently higher costs, there was a loss of £2,267 19s. 10d. on the year's working of the mine. He was pleased to be able to say that the mine manager was making good headway with the development, and hoped shortly to be able to give Government the full contract quantity; as also he had reduced his working cost. With regard to the matter of tests as mentioned at the last annual meeting, a fresh test of their coal was called for, and as the result of this the price was unfortunately reduced. Notwithstanding the lower test, the coal as supplied to the railway was doing just as good work as ever, thus proving that the firemen and drivers on the test trains were not accustomed to working with it. The consequence was that the test went against them. It was, he need hardly say, a very vexed question with the management, and until some more satisfactory mode was arrived at for making the test they could not look for any improvement. Every possible care was, however, taken to give the Government a uniform quality of coal,

VIEWS ON THE MESSINA MINE.







Framework New 250-ton Concentrator Plant at No. 4 Shaft.
First Train through the Zand River Poort.

Reverberatory Smelting Furnace.
Arrival at Liliput of the First Train.

PROSPECTING IN OUTSIDE DISTRICTS.

Exploring the Zoutpansberg—Activity in the Barberton Area.

THE railway construction now proceeding in the Northern Transvaal is certain to bear fruit in the shape of greater prospecting activity in the near future. It is understood that several prospecting parties are now engaged in exploring various mineralised portions of the vast and hitherto more or less inaccessible Zoutpansberg district.

RE-STARTING ZOUTPANSBERG MINES.

Moreover, schemes are on the tapis for re-starting one or two Low Country mines which have lain idle now for a number of years, but which with improved railage facilities possess distinct chances of profitable working. For one such proposition schemes were so well advanced that work was to be resumed a fortnight ago, but the spread of the strike on the Rand adversely affected financial arrangements, and for some little while longer the property in question will have to remain dormant.

BARBERTON.

Not only the Zoutpansberg but one or two other outlying districts of the Transvaal are now receiving marked attention on the part of prospectors. Barberton in particular appears to possess something almost akin to magnetic fascination not only for the poor pioneers of the mineral industry but for wealthy and influential mining companies as well at the present. Both the Central Mining and Investment Corporation and the Consolidated Gold Fields have recently been carefully investigating a number of mineral properties in the Barberton area, and other firms and individuals are busying themselves with examining abandoned properties and experimenting with old heaps of tailings containing high gold values in the presence of refractory elements. Some idea of prospecting activities may be gained from an examination of the statement periodically issued by the Mines Department as to the numbers of prospecting permits in force and prospecting, diggers and base metal claims held at different dates. The latest return published—*i.e.*, for April 30th—shows that in the whole Transvaal 549 prospecting permits were in force as compared with 582 at the end of last year and 814 at June 30th, 1912. For claims the figures are: 20th June, 1912, 151,011; 31st December, 1912, 138,273; 30th April, 1913, 141,095. An examination of districts shows that Barberton records the largest advance—from 14,079 at June 30, 1912, to 14,725 at 31st December, 1912, and 20,142 at the end of April last. The principal increase is in regard to base metal claims.

THE OFFICIAL RETURN.

The return in abbreviated form is as follows:—

District.	Prospecting Permits.		Claims.			Total Claims.		
	31st Dec. 1912.	30th April, 1913.	Prospecting. 30th April 1913.	Diggers. 30th April, 1913.	Base Metal. 30th April, 1913.	30th June, 1912.	31st Dec., 1912.	30th April, 1913.
Johannesburg	93	80	11,639	5,603	—	17,397	17,241	17,242
Krugersdorp	3	5	15,115	1,994	—	17,959	17,520	17,109
Boksburg	2	2	23,306	2,424	277	26,234	25,013	26,007
Heidelberg	28	32	6,889	404	—	10,206	7,006	7,293
Klerksdorp	34	52	2,307	171	49	3,322	2,896	2,527
Ottoshoop	32	11	32	14	633	698	767	679
Pretoria	28	35	—	—	161	11	211	161
Barberton	152	148	4,716	323	15,103	14,079	14,725	20,142
Pilgrims Rest	82	75	7,142	95	96	7,139	6,717	7,333
Pietersburg	128	108	2,545	86	39,971	53,966	46,177	42,602
Totals	582	549	73,691	11,114	56,290	151,011	138,273	141,095

FUTURE OF THE VILLAGE MAIN REEF.

Another Prosperous Year—Success of the "Selective Mining" Policy—Chairman's Views on the Life of the Mine—Further Purchase of Village Deep Shares.

THE 21st ordinary general meeting of the shareholders of the Village Main Reef Gold Mining Company, Ltd., was held at Cannon Street, London, E.C., on Thursday, June 26, 1913. Mr. M. A. Braunstein, chairman and managing director, presided.

The Chairman said: This is the 21st annual general meeting of the company. During our existence our shareholders have received nearly three millions in dividends, and for the last five years the dividend has not been less than at the rate of 70 per cent. per annum. We would all naturally like this to continue for ever, but mines, unfortunately, do not live for ever, and we must have in mind that in a few years we shall have exhausted all the ore which can be profitably worked. As regards the accounts, our share capital remains as before at £472,000. The reserve account now stands at £60,393, being £19,378 less than last year, the difference being accounted for by depreciation of the plant, machinery, buildings, etc. Our contingent liability on shares held, but not fully paid, is £6,815. On the other side of the balance sheet, our investments are represented by the sum of nearly £150,000, being over £38,000 more than last year. This increase is mainly caused by our having purchased during the year 17,352 shares in the Village Deep Company, in which company our holding at this moment stands at 110,000 shares. The Village Deep, in which we are so largely interested, declared dividends during 1912 amounting to 3s. 6d. per share. During the previous year the dividends amounted to 2s. The development has increased by 111,000 tons, and the average assay value is 29s. 5d. per ton, being an increase of 3s. 4d. per ton.

A RECORD PROFIT.

The profit and loss account is again a record. The working profit realised during the year is £443,175 16s. 9d., and is about £40,000 more than the previous year. During the year we paid two dividends of 7s. each, and we are carrying forward £377,239 13s. 11d., which is about £113,000 more than the previous year. The actual recovery from the ore milled was, according to Mr. Raine's report, approximately 2s. 3d. per ton more than the previous year, but the working costs have increased by nearly 7d. per ton. The result is that our profit has increased by about 1s. 8d. per ton. We milled 470,056 tons, a slight decrease on the previous year, owing to some shortage of native labour during the early part of the year, and other causes. The running time of the mill was 297 days, or 14 days less than in 1911.

ORE RESERVES.

I do not think I need take up more of your time in dealing with the reports and the accounts, but I would call your attention to the very important and interesting statement as to our reserves. According to Mr. Raine, these amount to 1,683,066 tons, of an assay value of 33s. 7d. per ton. In this connection, I would remind you that, in addition to these ore reserves, there are certain portions of the mine which are still undeveloped, and which are not taken into account by Mr. Raine in estimating the ore reserves. As I informed you last year, we cannot now give you any estimate of the profit we shall derive from the undeveloped area, but I am advised that the ore which will be recovered from it will very probably be about 600,000 tons. This ore will be stoped from existing faces, thus avoiding the expense of further development. Perhaps I may be permitted to say a few words with reference to the result of the new system of working the mine which Mr. Marriott inaugurated about four years ago. The result is that we have attained the position of being able to pay 14s. per share per annum, and we have, in addition, accumulated a very large sum. I hope you will join with me in congratulating my colleague, Mr Marriott, on the success of his system, and I may remind you that he did not succeed in introducing it without opposition.

LABOUR.

I have already referred to the shortage of labour to which we attributed our slightly reduced operations during the year. The reduction of working hours from nine to eight hours a day has, of course, affected us. As regards native labour, our full complement is 3,638 boys, but in April last we only had 2,900. The Government has recently prohibited the further recruiting of natives from tropical territory. At our mines we only have about 370 of these natives. There is, no doubt, a potential sufficiency of suitable native labour in South Africa, but the supply is affected periodically by various causes. We have decided to join the Native Labour Recruiting Corporation, which has been recently formed, and which is supported by, I believe, all the principal mining companies on the Rand. This corporation has absorbed the separate organisations of the various mining groups, and it is anticipated that in future the recruiting of natives will be better organised by the corporation, and that the cost of recruiting will be lessened. The Parliament of the Union of South Africa has also passed a measure for the further protection of the white and coloured underground workers. An Act has been passed making it compulsory for the mining companies to contribute to a fund for the insurance and compensation of workers who contract miners' phthisis. This contribution falls somewhat heavily upon the companies, and it is estimated that our company's subscription will amount to about £7,000 for this year, about £3,000 for the next two years, and afterwards to considerably less. Our total contribution for six years is estimated at £37,884. I may add that, independently of the Act, this company has done everything possible to eradicate the cause of the disease by appliances for the prevention of dust during blasting and other operations, and by paying every possible attention to hygiene.

LIFE OF THE MINE.

I would like, in conclusion, to say a few words about the life of the mine. I told you last year that, if our anticipations were realised our life might be extended for 2½ years after the 2½ years required to work the ore then developed. That is five years in all. There is nothing which causes us to modify that view at the time it was put forward, but I should tell you that it was based on the assumption that the annual tonnage would be the tonnage of which the plant is capable. You will realise that, as the blocks of ore become worked out, the number of faces, or points of attack, gradually decrease. This will probably mean a reduced tonnage monthly, but it naturally follows that the life of the mine will be proportionately prolonged. I now beg to move "that the report of the directors and the audited statement of accounts to December 31, 1912, be received and adopted, that the payment of dividend No. 24 of 7s. per share, free of income tax, to all shareholders registered on December 31, 1912, be hereby confirmed, and that dividend No. 25 of 7s. per share, free of income tax, be declared payable to all shareholders registered on June 30, 1913."

Mr. T. J. Milner (director) seconded the resolution, which was carried unanimously, and the meeting terminated.

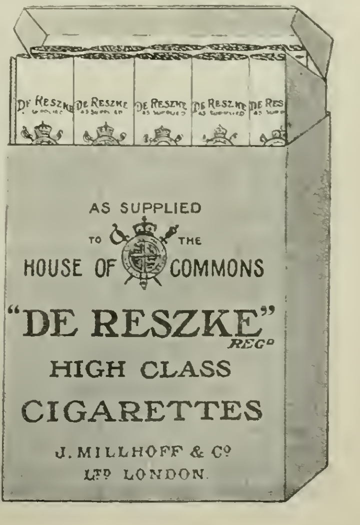
HYDRAULIC FILLING IN GERMANY AND OTHER COUNTRIES.

Differences in the Application of the Process.

An article in the *Glückauf* on "Hydraulic Filling in Germany and other Countries" gives the following general information:—To fill up the goaves and gunnies of coal and metalliferous mines a mixture of rubbish and water is made to pass through pipes to fill as compactly as possible the vacant spaces left by the removal of the mineral. This method was first tried at Mystowitz, Upper Silesia, in 1901, and during the past decade it has made enormous and rapid progress, notwithstanding the great expense of installation and the difficulties that at first sight appeared insurmountable. Many companies postponed its adoption in order to see the result, but it should be recognised that each mine has to encounter difficulties peculiar to itself. Besides, the process is sufficiently matured to permit of any serious failure. In Upper Silesia (its birthplace) hydraulic filling has been the most successful and the installations the best adjusted. Before the introduction of this way of preventing or alleviating the subsidence of the surface, the thick seams entailed the loss of serious quantities of coal that influenced the outbreak of fires difficult to extinguish. The conditions of exploitation have been benefited considerably by hydraulic filling, both as regards safety and economy. It can be applied to coal seams from 8 feet to 30 feet thick, having an inclination as high as 40 degrees. The materials used for filling are clayey sands, earthy rubbish, mine waste, and furnace cinder; clay, marl, furnace slag, zinc cinder, coal-dust, and sweepings are not often utilised, and then only sparingly. Where hydraulic filling is customary, surface depression has been reduced to 8 per cent. of the thickness of the coal removed. The inclusive cost varies from 1s. 2½d. to 1s. 7½d. per ton of coal raised. In Lower Silesia, out of twenty collieries, there are six which make the use of this method of filling the goaves. The seams are from 3 feet to 8 feet thick, with a dip varying between 10 degrees and 30 degrees. In the Westphalian-Rhine basin the hydraulic system is not so well developed as in the two basins referred to above, because it has not been always found advantageous, either through the installation being on too small a scale, or because good filling material was unavailable. There are about twenty-seven companies owning forty equipments, and utilising an aggregate of twenty-five miles of watercourse. The hydraulic method can only be made profitable when several companies unite to obtain economical transport of good quality rubbish. In the Sarre coalfields eleven mines have twenty installations, and the cost of the filling matter ranges from 9d. to 2s. 6d. per ton of coal extracted. In Prussia the Crownland mines employ the method in the iron and potash mines and in the salt-works, and also the Royal Collieries of Saint Ingbert, Bavaria, where large seams, dipping 32 degrees to 35 degrees, are worked by longwall as well as by pillar and stull. In Alsace-Lorraine it is used by the Sarre & Moselle Company, and by the Wendel Company at Petite Rossette. Outside of Germany the hydraulic process is widely utilised, more especially in coal mines; in Spain and Russia in some iron mines, and in the Transvaal in gold mines; at Limbough, in Holland, in a coal seam 9 feet through dipping 15 degrees from the horizon. In Belgium and in the coal basin of Aix-la-Chapelle, it is but slightly employed. In France hydraulic filling has been considerably developed, though only in collieries, and especially so in the Department of Pas-de-Calais, where the seams are generally of great size. The filling material is composed of furnace cinder, mine schist, and ore débris; also in the coalfields of Saint Etienne the method is widespread, the outfit at Saint Eloy being very remarkable. In Spain the Penarroya coal mine is being provided with an installation. In Austria and Hungary it is employed, principally in the lignite mines. Poland has taken advantage of the system, as also the Krivoi-Rog mines in mid-Russia. In Pennsylvania hydraulic filling is used in the anthracite mines. In the Transvaal it renders possible the stoping of the whole of the auriferous conglomerate, which, after the extraction of the precious metal, is run down the pipes into the workings, a slight sprinkling of bleaching powder or permanganate of potash reducing the proportion of cyanide to 0·0025 per cent., thus obviating all danger to the miners. The method has been applied to the lignite mines in Manchuria and to the coal mines of Mukden, where there is a seam 50 yards thick. Hydraulic stullage, which marks a great advance in scientific mining, is thus universally employed with economic advantage and great saving of mineral.

Village Deep.

The following cable was despatched to London on Wednesday:—"For publication. Owing to overwinding accident No. 2 shaft and delay in repairing caused by strike, battery stopped eight days in all. (Stop.) It is anticipated only 35,000 tons will be milled this month."



AS SUPPLIED TO THE HOUSE OF COMMONS
"DE RESZKE" REGD
HIGH CLASS CIGARETTES
J. MILLHOFF & Co
LTD LONDON.

Rhodesian Section.

LATEST MINING NEWS.

Shagari News—Eileen Alannah, Cam and Motor, and Falcon Plants—The Outlook—Falcon Developments—Share Depreciation—Amalgamated Properties—Numerous Reports.

The following are items from Shagari:—Mr. J. Knott has ordered two Nissen stamps for his Pomposa mine. The success of the Cobbe Middleton grinding pans at the Cheshire Cat and Mabel's Luck, has induced the Shagari Mines, Ltd., to order one. An expert from Johannesburg has just returned there after spending several weeks on the Tea Reef, experimenting with the slimes. The result of his labours is not public property as yet. At the Juno, Messrs. Nicholl and Millington have been, for a long time, handicapped over water. They pump from a shaft some distance from the mill, but what with soakage and evaporation they were constantly short. Now they have installed a number of storage vats or tanks and the water does not touch earth till it runs out with the slimes.

* * * *

The specifications for the new plant for the Eileen Alannah mine, are out for tender among the different mining machinery manufacturers. It is stated that they are from the designs of Mr. Bertram, mechanical engineer.

* * * *

Mr. Mason, of Johannesburg, who has erected the huge steel smoke stack for the Cam and Motor, has secured the contract for the erection of the steel tanks and other important items. Owing to the irregularity with which the different parts of any particular item of the machinery and plant come forward from Beira, the several contractors are periodically stopped in their work. I understand that the management contemplate sending a competent man to Beira to try to remedy this state of affairs.

* * * *

About 13 trucks of mining machinery have arrived for the Falcon mine and the rails for the new siding are being laid as quickly as possible to obviate the necessity of off-loading the heavy material yet to arrive. Work on the mine dam is progressing, but unfortunately Mr. Wotherspoon, one of the contractors, was recently thrown from his horse and sustained a broken leg. Mr. Drayton, his partner, has been in town for the past week superintending operations.

* * * *

Steady progress in connection with erection of equipment continues to be made at a number of large Rhodesian mines, and it is generally hoped throughout Matabeleland and Mashonaland the effect of the entry of new names into the arena of production will have a satisfactory and widespread influence next year. At both the Shamva and the Cam and Motor construction work is well advanced and the ore reserve positions of these two mines are such that it is certain they will add in a substantial degree to the mineral output of the country, will put fresh sums of money into circulation, and generally improve matters. For a long time the production has been round about 50,000 ozs. per month, and, as Mr. Geo. Mitchell remarked some little time ago, few people realize the important improvements going on, and the capital which has been put into development of ore reserves so that the rate of production will widen out and continue on a stable basis. Leaving out of account the ore reserves on the producing mines and the ore developed by small workers, on mines approaching the crushing stage there are now 6,106,450 tons of ore developed valued at £10,788,273, or about four years ahead of the present rate of production. The mines upon which the plants are now either in course of erection or on order will probably deal with a tonnage of 110,000 per month or 1,320,000 tons per annum. Last year there were 1,537,962 tons milled, so that Rhodesia is now within sight of almost doubling the tonnage. It is estimated further that every additional stamp leads to a direct increase of five tons per annum, at least, in railway traffic, while the indirect effect on the railways is incalculable. This is bound to have a most stimulating effect, as not only are developments well ahead of the mills, but there is every reason for believing that profits will be earned and distributed to the shareholders.

* * * *

Referring to the notice issued to the Press on May 27, the following cable has been received from the Bulawayo office of the Falcon Mines, Limited, concerning the re-sampling ordered by the board:—"I have just returned from the mine, and have to report that as far as check assays go I am perfectly satisfied the mine assays are correct, as the following goes to show:—

	Mine Assay plan value.		Check Assay value.	
	Gold. dwts.	Copper. %	Gold. dwts.	Copper. %
Average of 7 samples by mine assayers	6½	3·55	*5·75	*3·500
4 samples by mine assayers for copper only		4,800		5
11 samples by one assayer on the mine	8·650	3·280	†7·840	†3·400
10 samples by one assayer on the mine	6·900	3·200	7·300	2·900

* By Assay Office, Standard Bank, Bulawayo.
† By another mine assayer.

In November three checks were made by independent assayers; they agree closely. Further, our original samples from No. 1 crosscut east, from No. 9 shaft, No. 5 level, gave an average of 7·400 dwts. gold and 4·100 per cent. copper over 90 ft., and a stope now open up above gives an average of 7·660 dwts. gold and 3·990 per cent. copper over 65 ft.—J. G. McDonald."

* * * *

Evidently depreciation of Rhodesian share values has continued during the current year with unabated vigour. Lord Harris, presiding at a meeting of the Goldfields of Rhodesia Development Company held in London on Tuesday, said the rumours as to the reconstruction of the company were without foundation, and that the Consolidated Gold Fields Company had decided to help them to finance sub-companies. His lordship dwelt on the depreciation of the markets, and stated that the depreciation of the company's assets since March 31 amounted to £580,000. He declared, however, that he knew from experience that the clouds must disperse.

* * * *

At a meeting of shareholders of the Amalgamated Properties of Rhodesia held in London on Monday, resolutions were adopted authorising the voluntary winding-up of the company and its reconstruction with a capital of £800,000. Sir Abe Bailey announced that he would take up shares as promised, and agreed to arbitration regarding a loan of £100,000.

* * * *

The last published development statement of the Planet-Arcturus Gold Mines, Ltd., is dated London, the 9th May, 1913, and covers the quarterly period to the 31st December last. This gives the footage accomplished in the period on the Slate mine as 1,802 ft., on the Arcturus 1,461 ft., and on the Planet 439 ft.—total, 3,702 ft. The ore developed for the quarter was 10,697 tons in the Slate; 42,414 tons in the Arcturus; and 2,993 tons in the Planet—a total of 56,104 tons. Adding the ore in sight previous to the quarter's operations, the total ore reserves at the 31st December last read: In the Slate, 87,809 tons; in the Arcturus, 106,586 tons; in the Planet, 12,485—making the total of ore developed on the three properties 206,860 tons. In the three main shafts the sinking done in the quarter was: Slate, 91 ft.; Arcturus, 65 ft.; Planet, 74 ft.—total, 230 ft. The widths and values of the pay chutes were as under:—

	Total length of pay ore exposed. feet.	Average width of reef. inches.	Average value in dwts.	Total length of Level. feet.
Arcturus Mine—				
1st Level, Main Reef (a)	350	61	12·3	497
(b)	58	44	12·0	80
2nd Level, Main Reef (a)	480	116	12·0	1,012
(b)	65	32	6·7	
3rd Level, Main Reef ...	562	87	12·8	562
Slate Mine—				
1st Level, Main Reef ...	130	120	19·0	—
2nd Level, Main Reef ...	523	74	15·0	898
3rd Level, Main Reef (a)	479	91	12·6	832
(b)	15	34	10·2	24
Parallel Reef	252	27	8·3	363
4th Level, Main Reef ...	262	52	22·5	462
5th Level, Sump Reef ...	40	30	8·3	186
5th Level, Main Reef ...	—	—	—	29
Planet Mine—				
1st Level, Planet Reef ...	390	31	18·1	803
2nd Level, Main Reef ...	373	30	16·8	577

From the report of the Giant Mines for the quarter ended March 31, we take the following Driven, sunk, and risen, 659 ft.; ore developed at January 1, 179,457 tons; ore crushed, 32,645 tons; ore in sight at March 31, 146,842 tons; yield from mill, 9,610·812 ozs.; yield per ton treated, 5·888 dwts.; cost per ton crushed, 13s. 9·163d.; estimated working profit, £18,300, or 11s. 2·839d. per ton; capital expenditure, £3,014.

* * * *

The report of the Antelope Gold Mine for the March quarter states that the main reef ore reserves during that period were increased by 16,685 tons of an assay value of 10·3 dwts. per ton. The total ore developed at March 31 last was: Main reef, 141,286 tons, value 10·2 dwts.; eastern section, 6,217 tons, value 8·3 dwts.; south parallel reef, 14,201 tons, value 5·8 dwts.; north, 378 tons, value 12·3 dwts.

* * * *

While crushing still continues on ore drawn from the Teutonic claims, the directors of the Hanover G.M. Syndicate have made arrangements by which the shaft on the Hanover reef is to be carried down a further 100 ft. with the object of further developing the property. At the present depth of the shaft, viz., 180 ft., the Hanover reef has been exposed for a length of 187 ft., and over this length the average width is 3 ft. and the average assay value a fraction over 13½ dwts.

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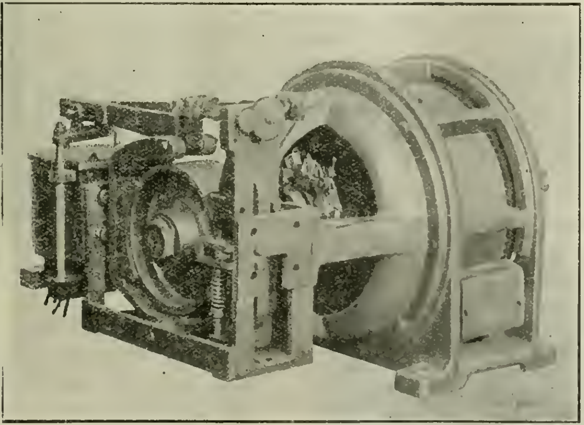

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DURBAN. CAPETOWN.

THE DEMANDS OF THE TRANSVAAL MINERS' ASSOCIATION.

Special, "Immediate," and General Requests—Benefit Funds and Workmen's Compensation—Eight Hours' Day for All Workers—Repeal of Law 6—No Sunday Work on the Mines—A Special Session of Parliament.

THE following are the "immediate" and "general" demands submitted on Thursday to the Government by the Transvaal Federation of Trades Unions, along with the covering letter: Sir,—I am instructed by the Executive of the Transvaal Federation of Trades Unions to forward you, in accordance with Clause 4 of the "Further Terms of Settlement" in connection with the general strike, the following grievances which require redress. I have also to state that a representative deputation has been appointed by the General Conference of the Federated Trades to confer with the Government in respect of the said requests. My Executive requests the favour of a reply before the 23rd July, 1913. I am at the same time handing a copy of these requests to the press for publication.—I have the honour to be, sir, yours faithfully, J. T. Bain, Secretary.

IMMEDIATE DEMANDS.

Submitted to the Government of the Union of South Africa by the Transvaal Federation of Trades Unions, acting on behalf of all workers concerned in the general strike, July 4, 1913.

To the Hon. Louis Botha, Prime Minister of the Union of South Africa.

Sir,—The Transvaal Federation of Trades Unions, instructed by the duly-accredited representatives of all workers taking part in the general strike declared on their behalf by the above Federation on July 4, 1913, herewith requests the Government to call immediately a special session of Parliament for the purpose of giving effect to such demands as may require legislative action to determine.

EIGHT HOURS' BILL.

1. Pending the introduction of an Eight Hours' Bill, we request the Government to take such steps as will secure the immediate adoption of this principle.

RATES OF PAY FOR TRANSVAAL AND ORANGE FREE STATE.

2. That the minimum wage for skilled surface mechanics be at the rate of 2s. 6d. (two shilling and sixpence) per hour, excepting drill sharpeners, who shall be paid at the rate of 25s. per day of 8 (eight) hours, and that all unskilled white workers be paid on the basis of not less than 50 per cent. of the standard wage obtaining amongst skilled mechanics.

UNDERGROUND WORKERS—SKILLED.

3. Skilled workers employed underground shall be paid not less than 22s. 6d. (twenty-two shillings and sixpence) per shift, for eight hours from bank to bank, or 48 hours per week. Saturday afternoon half-holiday to be safeguarded.

APPRENTICES.

4. All apprentices to be fully indentured, and that each apprentice be placed under the charge of a journeyman, so as to be thoroughly taught his trade, and no apprentice mechanic be allowed to work underground, or to work overtime under any consideration, and that all apprentices after completion of their apprenticeship shall be classed as journeymen.

OVERTIME.

5. (A) That all overtime (exclusive of Sundays and public holidays) be paid for at not less than time-and-a-half rates. (B) That all work on Sundays and public holidays be paid for at double rates; this to apply to both surface and underground workers.

NIGHT WORK.

6. That all men employed on night-shift work be paid at the rate of time and a quarter for all such work; this to apply to all mechanics.

POWER STATIONS.

7. That for all men employed in power stations 40 hours shall constitute a week's night work.

UNDERGROUND DRILL SHARPENING, ETC.

8. That the performance of work underground which can be done on the surface (underground drill sharpening, etc.) be made illegal, on the grounds of its being injurious to health.

MINE EMPLOYEES' TENANCIES.

9. That occupants of married and single men's quarters on mines, factories and workshops shall be entitled to one month's notice before being compelled to vacate same.

FAIR WAGE AND CONDITIONS CLAUSE.

10. That a fair wage and conditions clause be inserted in all Government contracts.

WEEKLY WAGES.

11. That the wages in the trades and callings set forth in Schedule (A) be paid weekly in coin.

GENERAL DEMANDS

Submitted to the Government of the Union of South Africa by the Transvaal Federation of Trades Unions, acting on behalf of all workers concerned in the general strike of July 4, 1913:—

To the Hon. Louis Botha, Prime Minister of the Union of South Africa.

Sir,—The Transvaal Federation of Trades Unions, instructed by the duly-accredited representatives of all workers taking part in the general strike declared on their behalf by the above Federation on July 4, 1913, herewith requests the Government to call immediately a special session of Parliament for the purpose of giving effect to such demands as may require legislative action to determine.

REPEAL OF LAW 6, 1894.

1. That Law 6 of 1894 be repealed, so that the right of free speech and public assembly be secured to the people of South Africa for all time.

A NATIONAL EIGHT HOURS' DAY.

2. The establishing by law of a maximum eight-hour working day (to consist of a 48 hours working week) for all trades and callings as set forth as per schedule "A" annexed. The legislative enactment giving effect to the above to also provide for the admission of any trades or calling not included in the said Schedule "A" attached to the benefit of the Eight Hours Act upon the Union representing such trade or calling declaring in favour of the eight hours day.

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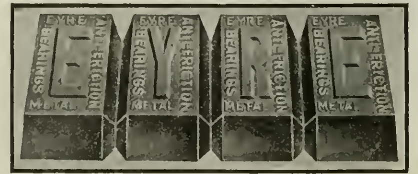

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INDUSTRIAL DISPUTES PREVENTION ACT.

3. That the Industrial Disputes Prevention Act, 1909 (Transvaal Act No. 20, 1909) be repealed.

ABOLITION OF SUNDAY WORK ON THE MINES.

4. That all Sunday labour on mines, including reduction works, shall be prohibited, and that only work of absolute necessity be allowed.

SUNDAYS AND PUBLIC HOLIDAYS.

5. (A) That a national system of holidays be established, such holidays to consist of ten days' continuous vacation for each worker in each year, such holidays to be arranged mutually, and in addition the public holidays, Good Friday, May 1, July 4, and Christmas Day. (B) That all labour, other than work of absolute necessity, be prohibited on the said public holidays in respect to the trade and callings set forth in Schedule "A."

IMPORTED AND INDENTURED LABOUR.

6. The prohibition of all imported contract labour.

FACTORY AND WORKSHOPS ACT.

7. That a Bill be introduced to provide for healthy working conditions in all workshops and factories, and other places of employment, and that sufficient competent inspectors be appointed to ensure the due observance of all regulations in connection therewith, and that the proposed Bill be referred to the Federation of Trades before being submitted to Parliament.

WAGES BOARDS.

8. That Wages Boards be established for the purpose of fixing minimum wages, and that until such Boards have been established and have adjudicated thereon, the rate of wages set forth in annexed schedule marked "B" shall be the minimum wage for the respective trades, and for the respective districts therein set forth.

LIEN ON WAGES.

9. That a Bill for the purpose of protecting and safeguarding workmen's wages shall be introduced whereby preference shall be given to workers in respect of wages due to them, and that such Bill be submitted to the Federation of Trades before being placed before Parliament.

MINES SICK AND BENEFIT SOCIETIES.

10. That steps shall be taken whereby the various Mines Sick and Benefit Societies' funds shall be consolidated and placed under Government control on the lines of the Majority Report of the Mines Sick Fund Committee.

WORKMEN'S COMPENSATION ACT.

11. That the Transvaal Workmen's Compensation Act be amended on lines to be hereafter determined, and that the said Transvaal Act, with its amendments and improvements, be extended to the whole of the Union. Such Bill to be first referred to the Federation of Trades before being submitted to Parliament.

Auckland Park Real Estate.

At the general meeting held recently in London, Mr. Edmund Davis referred to the probability of a reduction in the capital, stating that it would probably take the form of a reduction of the face value of the shares from 20s. to 16s., and a return of capital amounting to 4s. per share.

Rezende Mines.

The results for the month of June, 1913, were as follows:—Central section, estimated profit, £1,427; old west workings, estimated profit, £751; Penhalonga section, estimated profit, £388; total estimated profit, £2,566.

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Outside Districts.

Natal Coal Industry.

The following is the official coal and labour return for May:—

	Labour.	Tons.
Dundee Coal Company	2,102	40,731
Natal Navigation	1,334	34,129
Utrecht	934	26,179
Hlobane	909	24,932
Durban Navigation	1,034	24,648
Elandslaagte	1,063	20,649
Glencoe (Natal)	950	19,920
Natal Cambrian	787	18,032
Ballengeich	642	13,481
South African	848	12,131
Hatting Spruit	455	11,094
Newcastle	381	7,651
Natal Steam	289	6,101
Ramsay	283	6,099
Wallsend (Natal)	260	3,122
Fairleigh	125	1,390
Dewar's Anthracite	75	605
Star	34	552
South African (Vryheid) Coke	63	527
Avon Collieries	15	297
Vaalbank	3	7
Totals	12,586	272,277
Corresponding month, 1912	10,866	247,815

Coal bunkered and exported at Durban: Bunker coal, 99,811 tons; coal exported, oversea, 40,007 tons; to Union ports, 30,269 tons; total, 170,087 tons.

MINING MEN AND MATTERS.

Professor Yates has returned from vacation to open the new session of the Mining Institute at the Johannesburg and Kimberley centres.

* * * *

Mr. Raymond Schumacher left for England by this week's Imperial mail.

* * * *

Mr. J. G. Lawn, consulting engineer to the Barnato House, who postponed his departure for England a fortnight ago, left by this week's Imperial mail.

* * * *

In view of the recent occurrences it has been decided to postpone the holding of the monthly general meeting of the Chemical, Metallurgical and Mining Society of South Africa until next month, when the meeting will be held on the third Saturday, *i.e.*, the 16th August. Members wishing to submit papers, proposals for membership, etc., are requested to forward them so as to reach the secretary not later than the 1st August.

In the Rand High Court an order was granted this week confirming a reduction of the capital of E. Friedlander & Co., Ltd., from £252,500 to £75,937 10s., by cancelling 50,000 ordinary shares not taken, and by returning to the holders of founders' shares and holders of 200,000 ordinary shares issued, paid-up capital, as and when available for distribution, to the extent of 12s. 6d. per share. Mr. H. Hosken appeared for the company.

Good Positions Vacant.
For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings, corner Eloff and Pritchard Streets, Box 2061.

THE WEEK IN THE SHAREMARKET.

Depression Deepens—Prices Reflect Growing Fear of General Stoppage of Industry.

For obvious reasons prices have sagged away during the week, and the outlook is regarded as extremely gloomy. Naturally, the more speculative stocks were the first to suffer, and all show substantial reductions. Tins and diamonds reacted severely, and now stand at bargain prices. No Rand stocks could, of course, withstand the pressure to sell and dividend payers shared the fate of the rest. There is still hope that the long and elaborate list of demands put forward by the Federation of Trades may be modified or submitted to arbitration, but the pessimists who fear the effect of success upon the leaders are in the majority. The issues are clear enough—industrial ruin and anarchy on the one hand, or sweet reasonableness on the part of the Unions resulting in gradual amelioration in all the directions sought.

	Friday, 11th.	Sat., 12th.	Mon., 14th.	Tues., 15th.	Wed., 16th.	Thurs., 17th.
African Farms ..	14 9	14 6	14 6	14 3B	14 3	13 0B
Apex Mines ..	22 6	21 3B	21 0B	21 0B	21 0B	20 6
Aurora West Uniteds	—	—	—	—	—	8 0B
Bantjes Cons. ..	18 9	17 6B	—	—	18 0s	15 0B
Benoni Consolidated	—	2 11B	3 0B	3 0B	3 0B	3 0s
Blaauwbosch Diam.	—	90 0	—	—	—	—
Brakpan Mines ..	63 0	60 6	60 0B	60 0B	61 0*	55 6B
Breyten Collieries	—	27 3B	—	—	27 0B	—
British S.A. ..	—	—	19 0B	19 0B	—	—
Bushveld Tins ..	0 7B	0 7B	0 7B	0 7B	0 9s	0 6
City & Subs. (£4) ..	42 0B	42 0B	42 0B	42 3B	42 6	40 9B
City Deeps.. ..	54 0B	54 0	53 6	53 0B	53 6	57 0B
Cloverfield Mines ..	4 6B	4 6	4 6	4 6	4 6	4 0B
Cons. Langlaagtes..	25 6B	24 0B	24 9B	25 3B	25 0B	25 0s
Cons Main Reefs ..	16 9	16 0B	16 0B	16 0B	15 3B	15 0
Cons. Mine Select...	—	—	10 0s	—	10 0s	—
Coronation Freeholds	—	0 4B	0 4B	0 4B	0 4B	0 4
Coronation Synd. ..	—	—	—	—	3 9s	—
Crown Diamonds ..	11 0	10 6	10 9B	11 3	10 6B	9 0B
Crown Mines Debs.	—	—	—	—	—	£98s
East Rand Centrals	—	—	8 0B	8 0B	—	—
East Rand Coals (2/6)	1 9B	1 6B	1 9B	1 8B	1 8B	—
East Rand Deeps ..	2 0	—	2 1B	2 0	—	—
East Rand M. Est.	8 0B	8 0B	—	—	—	—
East Rand Props.	50 9B	50 6B	50 6	50 0B	49 0B	48 0B
East Rand Debs. ..	—	£87½B	£91s	£90s	£90s	—
Eastern Golds (1/-)	—	—	1 3B	1 3B	1 3B	1 4B
Frank Smith Diam.	11 6B	9 6	9 6	10 3	9 9	8 9
Geduld Props. ..	21 0	20 3	20 6B	20 0B	21 3	21 0†
Geldenhuis Deeps	—	—	—	—	25 0B	25 0B
Glencoe (Natal) Colls.	7 0B	—	6 9B	—	7 0B	—
Glynn's Lydenburg	17 0B	17 3B	17 0B	17 3B	17 0B	17 0B
Government Areas	21 6	20 3	20 9B	21 0	20 6	19 6
Hex River Expls...	—	—	—	0 6B	—	—
Jumpers	—	—	5 0s	—	5 0s	5 0s
Jupiters	7 6B	—	8 6s	—	6 0	—
Kaalfontein D. (2/6)	0 3B	—	—	0 3B	—	0 5s
Klerksdorp Props.	2 0B	—	2 0B	2 0	—	2 0B
Knight Centrals ..	8 6	8 3B	8 9	8 11	8 9B	8 3B
Lace Props. ..	3 0B	3 0B	3 0	3 0B	2 8B	3 0s
Lydenburg Gold Fms	3 0B	3 0	3 0	3 0B	2 9B	—
Main Reef Wests ..	9 6B	9 6	9 9B	9 6B	9 6	8 6s
Middlevlei Estates	—	1 0B	1 0B	1 0B	—	1 0
Modder B's.. ..	73 6B	72 6B	73 0B	74 6B	75 6s	72 0
Modder Deeps ..	31 6	30 0	30 0B	29 6B	29 0B	28 6B
Natal Navigation Col.	—	16 0s	—	—	—	—
New Boksburgs ..	—	0 6B	1 0s	0 6B	—	—
New Era Cons. (5/-)	6 6B	6 6	6 3B	6 3B	6 6B	5 9B
New Geduld Deeps	2 4B	2 4B	2 4B	2 4B	2 4	2 0B
New Kleinfonteins	21 0s	19 0B	19 0B	20 0s	19 0B	17 6B
New Modders ..	220 0B	220 0B	220 0B	220 0B	220 0B	215 0B
New Rietfonteins ..	4 6B	—	4 6B	4 9B	4 9B	4 6B
New Unifieds ..	—	—	15 0s	—	15 6s	—
O.F.S. & Trans. Dia.	1 6B	1 7B	1 6B	1 9s	1 6B	—
Potchefstroom Est.	—	—	0 6B	—	—	—
Pretoria Cement Co.	—	48 6B	—	48 6B	49 0B	—
Rand Klips ..	—	1 0B	1 4	1 3B	1 4B	1 0B
Rand Nucleus ..	2 0B	2 0B	2 1B	2 0B	2 0B	—
Randfontein Deeps	—	—	—	—	2 3B	2 6B
Randfontein Est. ..	25 6B	25 6	25 0B	25 6	25 3B	25 0
Roberts Victors ..	—	34 0s	—	—	35 0s	—
Robinson Deeps ..	—	—	—	—	37 0s	—
Rooiberg Minerals	27 9B	28 0	28 0	28 9	28 6	27 6
Roodepoort Durbans	—	—	—	—	—	20 0B
Ryan Nigels ..	—	3 6	—	3 6B	—	—
Shebas	5 0B	5 0B	5 0B	4 9B	4 9B	4 6B
Simmer Deeps ..	2 0B	—	—	—	—	—
S.A. Breweries ..	—	38 0B	38 0B	—	37 6B	—
S.A. Lands ..	3 6B	3 6	3 3B	3 4B	3 3B	3 2
Springs Mines ..	15 6	15 3	15 3B	15 3B	14 6B	14 6
Sub Nigels ..	10 3B	—	9 9B	10 6B	9 9B	8 6B
Swaziland Tins ..	40 0B	—	—	—	41 0	40 0B
Trans. Coal Trusts	36 3	35 0B	36 0	36 6	36 3B	34 0B
Trans. Cons. Lands	—	20 0B	20 3B	—	20 0B	—
Trans. G.M. Estates	52 0B	51 6	53 0s	—	50 6B	50 6
Van Ryn Deeps ..	30 6	29 6	29 6B	29 9	29 6	28 0
Village Deeps ..	40 0	38 0B	40 0	40 6s	—	39 0B
Vogel. Cons. Deeps	1 0	—	—	—	—	—
West Rand Cons. ..	—	—	—	—	10 0B	—
West Rand Estates	—	—	—	—	4 0B	—
Witbank Collieries	41 0B	41 0B	41 0B	41 0B	41 0B	—
Witwatersrands ..	64 0B	62 6B	63 6	63 0B	62 6B	61 6B
Wit Deeps ..	57 6	56 6	56 6	56 0B	50 0B	50 0B
Wolhuters	13 9B	13 6B	13 9B	14 0B	13 6B	12 6
Zaaiplaats Tins ..	33 9	33 6	34 6	36 0	35 6	33 0

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CORRESPONDENCE AND DISCUSSION.

Southern Main Reef Exploration Syndicate, Limited.

To the Editor, *South African Mining Journal.*

Sir,—I shall feel greatly obliged if you will be good enough to publish a few particulars regarding above syndicate. I am anxious to know whether they are still in existence, and, if so, what they are doing; and whether you think it advisable for me to dispose of the shares (50) which I hold. I shall be glad also if you will advise me their present address. Thanking you in anticipation.—Yours, etc.,

"ENGINEER."

Natal Navigation Collieries,
Hatting Spruit,
Natal, 9th July, 1913.

[Perhaps the Secretary can oblige with some information on the subject.]

AUTOMATIC VENTILATING DOOR.

To the Editor, *South African Mining Journal.*

Sir,—Your article re the above (vide Saturday's issue of your Journal) would lead one not conversant with mining practice in other countries, to think that the Jupiter people had got hold of a new idea. This was amply proved by one gentleman—whilst discussing said article—describing the door as a new device evolved by the Howard shaft authorities. Well, knowing that this type of door was in use in the English coal mines when my father was a boy, I wish to state the fact for the benefit of readers not knowing this. The device mentioned is in use in the mine where I am at present employed, and was introduced into No. 1 shaft by Mr. S. Parsons about a year ago.—I am, etc.,

W. L.

West Rand Consolidated,
July 16th, 1913.

The Natal Main Roads Association, of which Mr. Lewis Byron, M.P.C., its founder, has been elected chairman, is an active body, and is at present urging upon the Natal Provincial Council, by petition, the necessity of putting the main road between Maritzburg and Durban into a state of thorough repair. It is pointed out that the traffic is continuously increasing, and that dangerous corners and hills should be indicated by warning signs and notices. The petition asks for the substitution of earthenware culverts for the numerous cross drains that cut up the surface of the road, and that a thorough and efficient system of road drainage be inaugurated.

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Engineering Notes and News.

COMPARATIVE EFFICIENCIES IN USE OF COMPRESSED AIR—II.

[BY G. A. DENNY.]

As the volume of air, owing firstly to the admission of warm air and secondly to the heat generated by the compression, will have greatly increased, the power required for its discharge will be proportionate to the bulk of air discharged. If at the moment compression begins, the air has a temperature of 60 degrees and if it were compressed to 80 lbs. gauge pressure, its final volume would be ·1968 of the original volume, if compressed isothermally, or ·3144 if adiabatically compressed, and the temperature in the latter case would be 375 degrees. In this instance, the volume of air after compression has a bulk of 60 per cent. greater than it would have had if the air had been kept down to a temperature of 60 degrees. Again if the air at the moment of compression had a temperature of 80 degrees or 20 degrees higher than before, and were compressed to 80 lbs. gauge, its final volume would be ·1552 isothermal, or 267 adiabatic, and the temperature in the latter case would be 432 degrees. Here the air after compression has a bulk of over 71 per cent. greater than it would have had, could the isothermal conditions have been realised. In order to discharge the increased bulk of air therefore we require over 71 per cent. more power than would be necessary if the temperature of the air could be retained at 80 degrees F. throughout the operation. The horse power required to compress 1 cubic foot of free air to a pressure of 80 lbs. adiabatically is ·184 of a h.p., and the power necessary for the discharge of 1 cubic foot of the compressed air into the receiver, is 1·85 h.p. The important practical considerations in the figures just given are that: (a) The air is not in a condition to be applied to our purposes, until we have expended a considerable amount of power in the reduction of its volume. (b) The power required for the discharge of the air is to a large extent wasted, because in the conditions we have taken we must discharge a bulk of 1·71 units of heated air, which after cooling becomes only one unit available for power. We may examine further, in the light of the foregoing statements into the pneumatic efficiency of the compressor. If a normal diagram from a single stage compressing cylinder be examined, it will be seen that it is exactly the opposite of a steam cylinder diagram; steam admission being represented by air delivery; and steam compression by the air re-expansion line. An interpretation of a normal diagram from a single stage machine compressing free air at 60 degrees to 80 degrees gauge ill show that the work may be divided as under: (a) Work done in raising air pressure; (b) work done in excess due to heat; (c) work done in expelling compressed air to the receiver. These operations may be expressed numerically as under, having reference to one stroke of the piston: (1) ·734 of the stroke used, at a mean effective pressure of 20·5 lbs. for bringing the air from atmospheric pressure to 80 lbs. gauge, or ·734 x 20·5 equals 23·911 stroke pressure units. (2) The excess bulk due to heat is 71·4 per cent., and the volume of compressed air at 60 degrees is ·1552 of the original volume. Therefore the excess work done due to heat is ·714 of ·1552 or ·1108 of the stroke, at the delivery pressure of 80 lbs., or ·1108 x 80 equals 8·864 stroke pressure units. (3) The part of the stroke which furnishes us with power in the receiver, that is for our purposes, the really useful portion of the stroke, is that proportion of it which is required to expel the volume which the compressed air will occupy when cooled, namely, ·1552 stroke working against a pressure of 80 lbs. or ·1552 x 80 equals 12·416 stroke pressure units. We thus have for the total stroke an aggregate of 36·327 stroke pressure units. The only portion, however, as before stated, which provides us with air at working pressure is that referring to the discharge, namely, 12·416 units, the remainder being losses in bringing the air up to pressure, and in heat. That is to say, we get a useful result only from 34 per cent. of the power put into the work, and 66 per cent. may be reckoned as loss. Apart from, and in addition to this loss, are the losses inseparable from the machine, as such. To begin with, the volume of air compressed is never the full contents of the cylinder, since there is clearance to be reckoned with, and lateness in reaching full atmospheric pressure, on the admission side. The mechanical losses may be put down at 10 per cent. for the friction of the machine, 10 per cent. for losses due to increased temperature of the air after admission, 10 per cent. for losses due to clearance, leakage, valve resistance, etc. This leaves 70 per cent. only available for air compression, and of this available amount of power, we have seen that only 34 per cent. does useful work. Then 34 per cent. of 70 per cent. or 23·8 per cent. is all the useful effect we get, expressed in terms of air delivered to the receiver. We have so far dealt with figures relating to single stage compression, and the question now arises, as to what extent the losses in single stage practice will be minimised by double stage compression. The sole object of double stage compression is of course the avoidance to the greatest extent practicable, of the heat losses, by cooling the first stage air, before it enters the second stage cylinders. Below are the figures so far as they relate to temperatures, of an actual test. The test was made upon a horizontal cross-compound two-stage compressor, with suction air valves mechanically operated, delivery valves of automatic design to close in equilibrium, air cylinders water-jacketed both on barrel and ends, intercooler between the cylinders: Temperature of air at intake, 81·6 F.; temperature of air, low pressure delivery, 252·1 F.; temperature of air, intercooler, 148·2 F.; temperature of air, high pressure delivery, 262·4 F.; pressure of air in intercooler, 34 lbs.; pressure of air in receiver, 91·7 lbs. It is interesting to note the effect of the jacket cooling on the air of the low pressure delivery. The final temperature of the air, without any jacketing, would be 310 degrees F., therefore the jacketing has lowered the temperature only 58 degrees and has affected the volume of air, therefore, to a very limited extent. If isothermally compressed, the volume of air would be over 30 per cent. less than the adiabatic volume, showing that the water jacketing in this case has given far from an efficient result. Turning now to the intercooler, we find that it lowered the temperature of the air by 104 degrees, but still the air had a temperature of 148·2 degrees or 66·6 higher than the original intake, and the capacity of the delivery cylinder would be prejudiced and its useless power increased proportionately to the excess volume occupied by the heated air. The complete cooling which is often claimed in the intercooler was, therefore, far from being realised in this instance. It is still a matter of opinion amongst many of the best informed engineers on this subject, whether for ordinary working pressures say up to 80 lbs. gauge, there is any advantage in double stage practice. In a booklet published by a well-known maker of compressors, the following statement is made: "The very processes of compounding may too easily lead into mechanical difficulties which in the aggregate may not only counterbalance the gain by compounding, but may actually swing the balance in the other direction, and result in a machine of lower efficiency, as compared to the single stage machine of the best class." Following upon the losses incident to the compression and delivery of compressed air to the receiver, we have the losses in the pipe lines and in the machines which utilise the air for power purposes. Theoretically the losses in air mains should be very low, given perfect conditions, and not great distances, but in ordinary mining practice there is no question that they are frequently very high. A test made under my own supervision in

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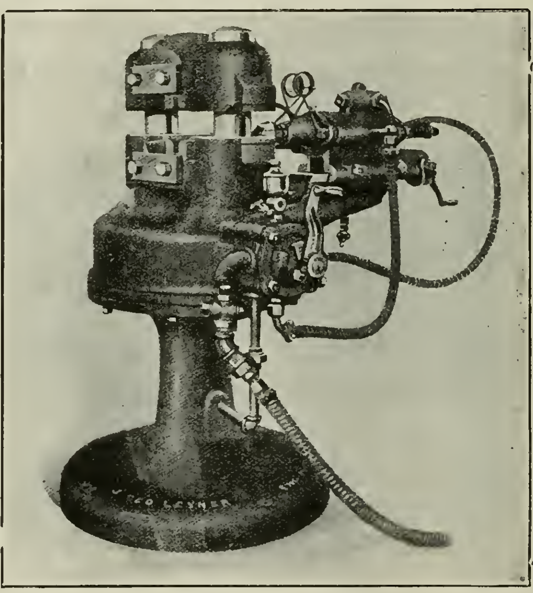

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JOHANNESBURG **INGERSOLL-RAND CO.** LONDON a large South African mine showed that the receiver and pipe line losses amounted to 11·5 per cent. of the indicated horse power of the engine. This loss is of course made up mainly of two components, friction and leakage, in what proportions could not be determined. It is probable that 10 per cent. would be a fair figure to adopt for leakage and friction in the ordinary mine installation. We have now to consider for a moment what efficiencies are obtained from compressed air in ordinary mine usage. Rock drilling and pumping are perhaps the principal applications of compressed air power in mines, though it is used for a variety of other operations, such as hoisting, signalling, ventilating, etc. Considered as an engine, the ordinary rock drill is not an efficient machine, since it uses air at full pressure throughout the piston stroke. The average drill develops about 1·5 h.p. In order to obtain this power, it has been proved by test that the steam engine working the air compressor must develop anything from 25 to 32 h.p. so that the over all efficiency of the system in terms of power at the rock drill bit is in the neighbourhood of say 5 per cent. It seems incredible that rock drilling operations are so inefficient, but it is nevertheless true, that the above rate is probably representative of the large majority of mine installations. Pumping by compressed air is largely resorted to in mines because of its convenience, or expediency, or both. On a test made under my own supervision on a large mine, in which all the auxiliary pumping was done by compressed air, using seven pumps, the efficiency of the pumps as a whole, on the original power put into the compression, worked out at between 9 and 10 per cent. The pumps used were the ordinary steam pump, in which all losses due to clearance, and unsuitability for the pressure used, were greatly exaggerated. Still they represent average practice in this respect, and the losses, similarly to those occurring in rock drilling, are so high as to seem almost incredible. I have said enough, I think, about the losses incident to the generation and use of compressed air, to stir up a vigorous defence amongst its champions, from which we must all benefit. In contradistinction to the losses involved in an air compressing and transmission system in its application to rock drilling, I will now state briefly the features and advantages of hydraulic transmission for a similar application. The outstanding difference between air and water from the point of view of power development and transmission is that water is non-elastic. Unimportant as this apparently simple difference is on first view, it will be found on closer examination to describe practical immunity from nearly all the heavy losses incident to air transmission and compression, as under: (1) There is no initial capacity loss due to increased temperature after admission to the working cylinder. (2) There is no complicated and expensive mechanism required in developing power, whether the head be gained by artificial or natural means, and there are no large friction losses. (3) There are no heat losses. (4) No power is required for the preliminary compression, and in consequence, instead of suffering the tremendous losses incident to the process of bringing the water up to working pressure, all the power is utilised in discharging it into the pressure mains. The importance of this is better appreciated, when we state that one unit volume of water at 1,000 lbs. pressure allowing 5 per cent. for cylinder and other losses, would transmit 65,000 volume units of pressure, whilst one unit volume of air compressed to 80 lbs. gauge, owing to the small percentage of the stroke available for delivery to the mains, would not transmit to exceed say 2,000 volume units of equal pressure. (5) There are no clearance losses. (6) With extremely simple mechanism very high working pressures from 500 to 1,000 lbs. and upwards per square inch may be developed. (7) At working pressures such as mentioned in the previous paragraph, the transmission losses are negligible, and the volume of water required, and the hydraulic mains, are very small. The over-all efficiency of a hydraulic system, in terms of power delivered to the hydraulic drills, would not be less than 80 per cent. The efficiency of the drill would range, according to the type employed from say 60 per cent. to 80 per cent. Therefore the over-all efficiency of the entire system would not be less probably than 50 per cent. On the same basis, the efficiency of a steam-driven compressed air system will not exceed 6 per cent. Mexico is a country of water powers, and potential hydraulic transmission projects. In view of the great advantages offered by hydraulic transmission and hydraulic drills, it is greatly to the interest of the mining community to make most careful enquiry into the possibilities of adopting it. Where natural fall is not available for pressure purposes, a pump of comparatively simple and efficient type is all that is required to develop any working pressure desired.

In the course of conversation, referring to attempt to find oil in South Africa, Mr. Cunningham Craig last week said:—" In many cases the undertakings have been absolutely hopeless from the start. Instances can be multiplied of places where some oil could be seen, but where it was impossible to get at. If," he said, " I had been out here some few years before, I might have saved a great many people money. Some splendid work has been done in drilling, but in many cases it has been entirely futile. In fact, it never had a chance of success from the first." Mr. Craig refused to express an opinion as to the results of his investigations up to the present, but said there is a possibility, even if oil is not found, of a discovery of gas. Natural gas is a very important thing. In Canada it is used enormously and pays exceptionally well. Then there is also a possibility of finding oil shales, quite a different thing from oil rocks. These, however, are only possibilities. Mr. Craig would not commit himself further than to say that he has seen oil in a great many places, very good oil, but in very minute quantities.

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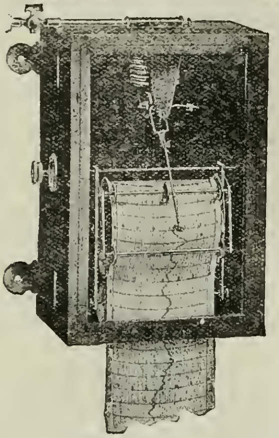

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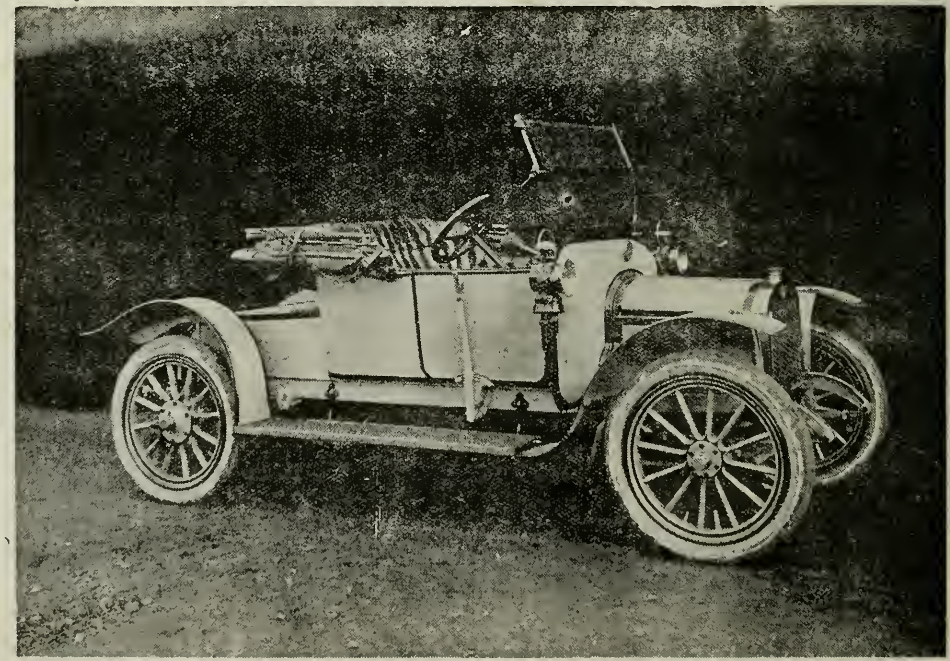

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Automobile Notes.

The Royal Automobile Club of South Africa has for some months past been engaged in arranging for the insurance of its members' cars, and for those of the members of clubs affiliated to it, on a more satisfactory basis than has hitherto been possible. It is understood that the negotiations have resulted in an arrangement whereby the General Accident, Fire and Life Assurance Corporation, Limited, of Greenmarket Square, Capetown, become the official insurers of the club. A model policy on the lines of that adopted by the R.A.C., London, drawn up by the sub-committee, through whom the negotiations were conducted, has been accepted by the company, and it is claimed that substantial advantages are secured to those interested. The insurers are secured against many of the pitfalls, often difficult to detect, which occur in many of the polices offered to motorists, and settlement of disputes by arbitration—in which the club is represented—is provided for.

* * * *

Some of the special features of the policy to which attention is drawn in a circular about to be issued by the club to its members, are: That the original value insured is not, during the period covered by the policy, subject to any arbitrary reduction for depreciation; the policy cannot be terminated until the expiry of the period for which insurance has been effected; third party risks are unlimited; costs of all legal proceedings are included; repairs may be put in hand immediately, and the company notified at early convenience; fire risk is covered wherever the car may be; cars may be insured on the R.A.C. rating or on the manufacturer's lowest H.P. rating. If the action of the committee is supported by the members of the club to the extent it deserves, substantial mutual benefit should result to the members through the advantages obtained—some of which are detailed above—to the company in the class of business secured, and to the club itself by the accession of new members which should accrue. We are informed that in many cases the economy effected in the matter of premiums will more than cover the amount of the yearly club subscription fee.

* * * *

The American business man is not often caught napping where opportunities for commercial enterprise are presented, but in the matter of providing motor cars suitable for the service in the Colonies, he has certainly been outstripped by British and Continental makers, and is taken to task on this score in one of the American motor papers in the following terms: "Very little indeed, hardly anything in fact, has yet been done by the American automobile industry to supply this demand to which English and Continental makers are catering so energetically, and, strangely enough, there seems to have been little effort made even to supply cars specially adapted to use in the rougher sections of the United States itself. If the American industry is to secure its share of this particular branch of motor car trade, it may well bestir itself before the manufacturers of other nations become too firmly entrenched therein."

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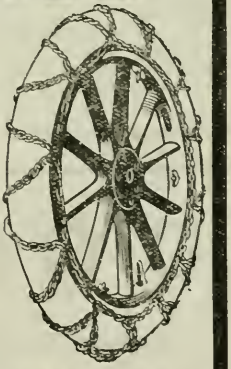

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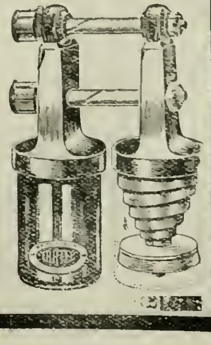

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As a result of the deliberations of the Taxation Committee, the Chancellor of the Exchequer has consented to receive a deputation on the question of the taxation of old cars. In England the taxation is according to horse-power, and, as an old car only develops about half the power of a modern car of the same rating, the owner of the former is unduly penalised.

* * * *

The California legislature has just passed a law which raises the speed limts on country roads from twenty to thirty miles an hour, and unifies the speed regulations in the various towns in the State, establishing minimum speed limits which cannot be abrogated by local ordinances. This is practically the position in the Cape Province under the new Motor Car Ordinance.

* * * *

THE RAND MOTOR-CYCLING CLUB.

The half-yearly meeting of the Rand Motor Cycling Club was held at Johannesburg the other night. There was a good attendance, over which Mr. J. T. White presided.

The committee's report stated that the membership now numbered 310, 86 of which were added during the last six months. The financial state of the club, though quite healthy, only showed a credit balance of £63 17s. 3d., and in view of the capitation grant now due to the Motor Cycle Union, the committee felt the position was not as satisfactory as it should be. Six social runs had been organised, all of which had been very well supported; five events of a competitive nature had been held, the large number of entries for which had been most encouraging.

Since the last general meeting, chiefly through the efforts of the committee, the Motor Cycling Union of South Africa had been launched successfully, and the establishment of a governing body would doubtless prove of great benefit to motor cycling generally.

With regard to motor legislation, the committee had been paying careful consideration to the club's interests; and the Provincial Motor Ordinance was now receiving attention. Thanks to the committee's efforts, the Boksburg Municipality had adopted a more reasonable attitude towards motorists, and had so amended its by-laws as to permit a speed limit of 20 miles an hour; and there was reason to believe that other Municipalities might eventually be persuaded "to modernise their trek-ox by-laws."

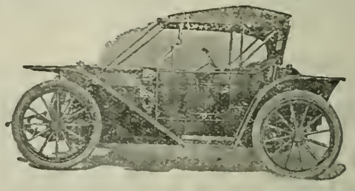
The prize winners in the various events held during the six months included:—Championships—Light-weight class: 1 (gold medal), P. Flook; 2 (silver medal), S. C. Middleton; 3 (bronze medal), W. Reckenberg. Standard class: 1 (gold medal), F. W. Clare; 2 (silver medal), F. H. Koenig; third did not finish. T.T. class: 1 (gold medal), J. Hodgson; 2 (silver medal), P. Flook; 3 (bronze medal), L. A. du Plessis. Open class: 1 (gold medal), G. Weddell; 2 (silver medal), T. Whittle; 3 (bronze medal), McFadyen. Side-car class: 1 (gold medal), A. W. McKeag; 2 (silver medal), F. Rose; 3 (bronze medal), J. Maine.

* * * *

The Divisional Council of Kimberley has undertaken, at the instance of the local club, to erect direction posts at all points on the main roads in that district where branch roads diverge. The Cape Peninsula Publicity Association have done much in this matter locally and are extending their operations within a radius approximating 8 miles, but a great deal remains to be done outside that area, and the R.A.C. of South Africa have the matter under consideration and are preparing, we are informed, to get into early communication with the various Divisional Councils on the subject.

* * * *

The Orange Free State Automobile Club, at its annual general meeting last month, decided to make the chairman, vice-chairman, honorary secretary and members of committee of all affiliated automobile clubs, honorary members of the O.F.S. A.C. during their terms of office.



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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

The Late Mr. Sauer.

The death of the Hon. J. W. Sauer, the Minister of Justice and Acting Minister of Harbours and Railways, has cast a gloom over the country this week. The record and life history of the deceased statesman have been printed in every paper in South Africa, and it only remains for us to pay a tribute to his many sterling, not to say great, qualities which make his passing a real loss to South Africa at this crisis in her history.

* * * *

Oceana Consolidated.

The board of Oceana Consolidated have issued a circular in which they state that a revaluation of the company's assets is now being made, and it is hoped to lay the results before the annual general meeting in October. At the same time, a review and classification of the farms in the Transvaal aggregating upwards of one million acres is being made. With regard to the holding in the Piccadilly Hotel, it is announced that a public company has been formed under the title of Piccadilly Hotel, Ltd. In this company Oceana holds 62½ per cent. interest. Participating 6 per cent. debenture stock to the amount of £250,000 has been created in consolidation of all the mortgage debts other than the first mortgage of £250,000, and the current earnings of the hotel show that a return of at least 7½ per cent on this stock may be anticipated. In general, the board state that their policy is directed to rendering existing assets more liquid.

* * * *

Scarcity of Coal.

The continued unrest in the Transvaal is adversely affecting the interests of Delagoa Bay, says the Delagoa Bay paper. The s.s. Rubonia and s.s. Losna are both loading coal for India, but fuel is only coming down in small quantities, with the result that steamers are being greatly delayed for bunkers. The Hall boat is still in the stream waiting for bunkers, and the s.s. Manica, which wanted 1,000 tons of bunkers, can only be suppiled with 60 tons to enable her to reach Durban. The s.s. Muansa has already been four days waiting for bunker coal. The Rennie liner Intaba has also experienced trouble in completing her bunkering. From all accounts, however, Durban is in the same position.

* * * *

Capital Applications.

The Economist by this week's mail gives a valuable survey of the capital issues on the London market during the first six months of the present year. The new applications in that period have amounted to slightly over 120 millions, a figure very much higher than at one time seemed probable, and actually higher than the new issues during the corresponding periods of the two previous years. Moreover, during April, May and June the new issues exceeded those of any previous corresponding quarter in the last ten years, with the single exception of 1910, when the rubber boom was at its height. With a 4½ per cent. Bank rate, and a general depression on the Stock Exchange, this is not a bad record. The statements, however, published by *The Economist* show that very little fresh capital has found its way to South Africa beyond the amount of the recent four million loan. The capital applied to mining companies in South Africa amounted to £749,000, or just about half the new issues for the same period of 1912. The total new capital which had South Africa as its destination in the same period was £5,439,100. Of this, as seen above, £4,749,000 is accounted for by the Union loan and the issues for mining companies, leaving only about £690,000 for all other purposes. We may compare with this the figures showing the new capital issues in the other British Dominions. Canada easily heads the list with a total application during the six months of £20,437,000. Australasia has taken very nearly twelve millions sterling. India and Ceylon have absorbed about three and a half millions, and other British possessions between them well under two millions. It may be remarked that Canada has actually absorbed in the six months as large a volume of new capital as the United Kingdom itself, and that no other country in the world has raised so much fresh money during the period named. Of foreign countries, the most considerable borrower on the London market has been Brazil. Some fifteen millions sterling have found their destination there in the past six months. Mexico, where big oil developments are in progress, has taken nine millions, the United States about the same amount, and China nearly seven millions.

Tonnages of the Further East Rand.

Our valued London contemporary, the *Statist*, in the issue to hand by last mail contains some interesting calculations as to the ore contents of the "newer" propositions of the Further East Rand area, the amount of ore exhausted in them to date and the amounts remaining. The calculations based on an assumed milling reef thickness of 30 inches, or 13,545 tons per claim, arrive at a total of ore remaining in the properties at the end of March last of over one hundred and twenty-five million tons. An application of the 30-inch width to each of the six individual companies in the order of magnitude of area gives the following figures:—

Reef Claims.		Tons.	Used to end May, 1913 Tons.
2,633	Government Areas ...	35,664,000	Nil.
2,481	Geduld	33,605,000	403,000
1,400	Modderfontein B. ...	18,963,000	638,000
1,271	Modderfontein	17,215,000	3,595,000
1,150	Brakpan	15,577,000	1,179,000
764	Van Ryn Deep	10,348,000	Nil.
9,699		131,372,000	5,185,000

Of the suppositious ore contents, the quantity used to May 31, 1913, represents less than 4½ per cent., so that, roughly, on above calculation, more than 95 per cent. of ore remains to be dealt with. It is reasonable to claim that in parts a greater average stoping width than 30 inches will be worked, "but," remarks our contemporary, "we would emphasise that we are only broadly pointing out the significance of addition of the enormous new Eastern area that is being attacked for its gold contents, and we are here referring to only part of the Eastern Rand."

* * * *

Microscopy in Economic Geology.

An address by Prof. R. Beck, delivered on the occasion of his inauguration as rector of the Royal School of Mines at Freiberg, Saxony, Oct. 3, 1911, has been translated by Joseph T. Singewald, Jr., and published in the May 31, 1913, issue of our contemporary, the *Engineering and Mining Journal*, N.Y. His subject is the use of the microscope in the study of rocks and ores, and he claims that such mining and geological engineers as wish to train themselves for consulting work, or such as wish to participate as pioneers in the mining development of new regions, and above all such as are striving to take an active part in the scientific part of practical geology, must familiarize themselves with the fundamental methods of microscopy. While the early protographers neglected opaque minerals and confined their studies as far as possible to fresh rather than altered rocks, their methods are now being successfully used in the study of all classes of ore deposits. Dr. Beck points out how microscopic study has given information concerning the origin of many ores, such as the platinum of the Urals, the nickel ores of Sudbury, contact metamorphic deposits of many districts.

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Labour Troubles Elsewhere.

The South Wales coalfield, like the Rand, is now having serious labour troubles. While the coalminers' minimum wage questions recently were being debated in London, a special conference of miners' delegates was being held at Cardiff, whereat a new schedule of rates and conditions was adopted in regard to both surface and underground workmen. It is proposed that before any new colliery or seam is worked the owners shall be required to assent to the terms ot this schedule. The scheme embodies an attempt to secure throughout the South Wales coalfield, in all future developments, a uniform schedule of rates of wages and conditions of work, and thus put an end to the practice of each colliery settling its own price list according to its own conditions. The scheme aims at preventing new seams being opened out until a price list has been settled between the owners and the Federation. The new price lists must contain all the rates and the conditions of the new schedule, and power is given to the sub committee to withhold its approval in any case where the proposed list contains any provisions which it considers likely to prejudice the interests of workmen employed at other collieries. It is provided that in the event of a collier failing to earn 5s. 4d. per day plus percentages, the owner should make up the difference to him. Surface workmen also come within the scope of the new scheme, and it is proposed that the hours of these men should also be reduced to eight per day. A further demand is that men engaged in afternoon and night shifts are to be paid at the rate of six shifts for five actually worked. In addition, all underground workmen are to be paid for each item, no dead work being recognised. An ingenious suggestion is made that in seams where price lists have not yet been arranged, the workmen should demand the introduction of the new schedule, and that, failing its acceptance by the owners, all the men should work on the rates under the Minimum Wage Act, it being argued that while this policy would secure a living wage to the men, it would so reduce the output of the seam that pressure would be put upon the owners to accept the new schedule in order to provide an incentive to the workmen to increase the output. Thus the eternal struggle between employers and workpeople goes on. The more the miners get the more they want, little heeding the commercial difficulties of the industry or the effect of constant rises in the cost of coal on the welfare of the millions of workers in other occupations whose earnings are far smaller. Such movements can have but one effect, namely, to increase the determination of coalowners to make no concessions. Demands of this kind tend to make difficult the acceptance of reasonable claims for, unfortunately, miners in general are true exemplars of the old saying that "given an inch they will take an ell."

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A Huge Decline.

That a heavy depreciation in prices of Stock Exchange securities has taken place during the past few months is a matter of common knowledge, but it may not be realised by some how great the fall really been. The fall in the 387 representative securities dealt with by the *Bankers' Magazine* amounts to just 88¼ millions sterling, or 2½ per cent. Not only is the fall on the month one of the heaviest during the past seven years, but the present aggregate valuation establishes the lowest point ever touched. Here are the figures:—

Market value, May 20	£3,485,174,000
Market value, June 20...	3,396,940,000
Depreciation	£88,234,000

The causes of this heavy decline are too well known to need repeating. Not only does the *Bankers' Magazine* deal with the past month's figures, but this time a comparison is made with January, 1907, when the list was previously revised. Compared with that time—some six and a half years ago—there has been a depreciation of no less than 447 millions.

* * * *

Base Metal Outputs.

After an absence of some months from the dividend list, the Zaaiplaats Tin Mining Company has resumed distribution, and announces a dividend of 45 per cent., or 2s. 3d. per 5s. share, payable to shareholders registered on July 31st. This announcement should in some measure help to allay the feeling of pessimism that appears to be abroad in regard to tin stocks at present, a pessimism traceable to the recent heavy fall in the price of the metal, as well as to the general despondency of the Kaffir market on account of industrial unrest. Examination of the figures issued by the Union Mines Department shows that last month the Transvaal raised 307·17 tons of cassiterite, containing 68·31 per cent. of pure metal. The Cape produced 12½ tons of 70 per cent. value. Sales and shipments were: Transvaal, 374 tons, value £41,061; Cape, 6·7 tons, value £811. In regard to copper the Transvaal raised 467 tons of marketable produce, containing 38½ per cent. of metal, and the Cape Colony 964 tons containing 49 per cent. of copper. Sales and shipments were: Transvaal, 575 tons, value

£12,938; Cape, 3,221 tons, value £88,515. For the Union figures as to tonnages and values of tin and copper shipments in May and in June of this year are:—

	Tons.	Value.
Tin—		
May	276·8	£35,015
June	380·7	11,872
Copper—		
May	179·9	4,402
June	3,796	101,453

The enormous advance in the copper sales is presumably due to better shipping facilities than were available in May.

* * * *

South African Collieries.

Figures issued by the Union Department of Mines for June show that throughout South Africa there were 66 collieries producing during last month. Of these 31 were situated in the Transvaal, 22 in Natal, 8 in the Cape, and 5 in the Orange Free State. The output for the Union of South Africa was 753,926 tons, of a value at pit's mouth of £190,159, as compared with 784,549 tons, value £196,188, in May. For the different Provinces the figures as to production in May and in June are as under:—

	Tons sold.	Value at Pits mouth.	Value Per Ton. s.	Value Per Ton. d.
Transvaal—			s.	d.
May	457,063	£98,813	4	4
June	448,781	98,887	4	5
Natal—				
May	267,533	79,395	5	11
June	246,913	73,221	5	0
Cape—				
May	6,104	3,255	10	8
June	5,956	3,409	11	5
Orange Free State—				
May	53,849	15,025	5	7
June	52,276	14,642	5	7

For the Transvaal figures according to districts were:—

	No of Collieries Producing.	Percentages of Waste Sorted to Tons Mined.	Total Coal Sold	Total Value realised at Pit's Mouth.	Value per Ton at Pit's Mouth.	
		%	Tons.	£	s.	d.
Springs-Brakpan area	5	29·54	43,836	£11,037	5	0·13
Middelburg area ...	16	13·71	340,486	75,191	4	5·00
Other areas	10	4·52	64,159	12,659	3	11·13

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Production of "Other Minerals" in the Union.

South Africa is probably one of the most highly mineralised countries in the world, and apart from its wealth in gold, diamonds, coal, tin and copper, it is known to contain a diversity of other minerals, both metallic and non-metallic. Apparently, however, enterprise in the direction of developing these other minerals is at a standstill at present. The only "other" mineral industry of importance—as disclosed by output statistics—in the Union of South Africa appears to be lime. Last year £125,470 worth of this commodity was raised in the four Provinces of the Union, of which the bulk came from the Transvaal. Apart from silver, which was contained in gold bullion (total value £119,106), and cannot therefore be regarded as a separate industry, the only other item of importance is £18,882, the value of the asbestos produced. Flint comes next on the list with a total value of £9,395. This presumably was raised for the purpose of supplying tube mill liners. Lead follows with a total value of £8,651; then "silver in other minerals," and next magnesite, £1,673. At the present time the Transvaal is producing lime at the rate of about one hundred thousand pounds worth per annum, whilst the Cape asbestos mines are raising asbestos at the rate of nearly £23,000 per annum. Apart from these, the mineral industry other than that of gold, coal, diamonds, tin and copper, is virtually non-existent.

TOPICS OF THE WEEK.

THE DEMANDS OF THE MINERS' UNION.

Comment on the demands of the Miners' Union is handicapped at this stage by the fact that a compromise may have been announced between the Government and the representatives of the men before this appears in print. It is certainly to be hoped that by Saturday the feelings of the public will have been relieved, and some indication given that the so-called "demands" of the Unions are—as it was only reasonable to expect them to be—merely put forward as a basis of negotiation. For it is impossible on closer examination of the T.M.A. "demands" to come to any other conclusion. In the first place, the outstanding feature of the Miners' Association's "demands" is that, unless considerably modified by the tone in which they are presented at the Conference, they are such as to admit of no immediate, satisfactory reply. The Government cannot seriously and forthwith consider proposals that in their entirety must obviously curtail the life of the "milch-cow" industry of the country. Nor can they flout the findings of their own Special Commissions, such as that on Sunday milling, by ignoring their enquiries and yielding to a purely arbitrary demand of the Union. The mining industry has grown up under conditions that have allowed Sunday milling. Capital has been invested in the knowledge of those conditions, and when, in the days of the Republic, the suspension of the privilege was strongly urged upon the Republican Government, President Kruger and the Volksraad—the great majority of whom were men traditionally bound to the strict Sabbatarian view—decided that the interests involved were too great to warrant their disturbance. President Kruger's attitude does suggest that extreme care is necessary before the country is committed to a course which may prejudicially affect the industry in which the prosperity of the whole Union is to a large extent bound up. According to General Smuts, inquiries made by the Department of Mines had shown that the effect of stopping Sunday milling would be to reduce the output by 14 per cent., and at the same time to raise the working costs by 2½ per cent. Further, it would mean that a large number of mines which to-day are running on a very small margin of profit, would have to close down. If these are considerations which the State, in carrying through a reform, might reasonably ignore, it is well first to inquire how many men would be affected by the stoppage of Sunday milling. It appears from General Smuts' statement that of about 25,000 white miners on the Rand, 80 per cent. have their Sundays free. To prohibit Sunday milling would release about 1,400 white miners, and of these it appears that all, or nearly all, obtain at least one Sunday off in every four. The whole question was debated at enormous length in the House of Assembly, and the case against the suspension of Sunday labour may be summed up in this: that it would tend to scare away capital, which has been supplied hitherto on the basis of Sunday labour; that it would involve the closing down of many mines, and therefore would throw out of employment hundreds of white men; that it would reduce the gold output, cut down the profits, and incidentally involve the Union finances in serious loss, equal perhaps to £150,000 per annum. Some of these arguments naturally are contested, but they have the support of the Kruger Government, the support of the Mining Commission of 1907, and the support of the officials of the Mines Department in 1911. No Government could save its dignity and run counter to them, without, at least, further consideration. The Sunday milling "demand," however, is but typical of some of the rest. It is argued by the supporters of the latter that the minimum wage merely means the abolition of the contractor from the mines of the Rand that the extra payment for five night shifts only means the abolition of the night shift altogether, and that the question of a minimum wage can easily be left to a special wage board for settlement. But these people speak with all the airy irresponsibility of those who have never been faced with a series of changes that may or may not permanently dislocate a whole industry, and even if the latter are granted to some extent, what guarantee is there that the "demands" will not be constantly renewed in an extended and amplified form? We are in the secrets neither of the Government nor of the industrial leaders, but it seems plain enough to the onlooker that no Government could coerce an industry into committing suicide at the polite request of a Trades Hall *junta*. Indeed, those responsible for the future of the industry may well say: " If we go forward we die; if we go backward we die—better go forward and die." Plainly, no other alternative will be left to them unless the men's leaders evince a reasonable spirit; rest content with accepting from the Ministers what the Government can with justice and dignity offer; and save the country from the ruin that otherwise threatens.

THE GROWTH OF STRIKES.

This country is far from being alone in suffering from labour troubles to-day. Disputes as to wages and hours have cropped up in many trades in Great Britain of late, and there have been threats of strikes on the railways, in the pits, the shipyards, and the engineering shops. No doubt some of these outcrops of industrial unrest will have to be tackled later, for not only the questions of higher wages, but of the eight-hour day are thrust into almost daily prominence. Engineering firms who have adopted the eight-hour day have generally been able to adjust their work with a fair degree of satisfaction, but in the coal trade the eight-hour system has pacified neither colliery proprietors nor miners, and has resulted in an advance in the price of fuel that is hampering manufacturers, exporters and corporations, especially those largely engaged in electricity supply for tramways and lighting. But amid the various demands of the working-men for further concessions, the desire for strikes appears to be now and again a little less impulsive, and the Steam Engine Makers' Society has issued a sensible note against the folly. Why, it asks, should not arbitration be tried before, instead of after, a strike? And in the query lies the whole crux of the industrial problem. In the St. Helens plate-glass trade, a most important industry, a skilful method of avoiding strikes has been in practice for many years. The employers insist upon every man and every apprentice out of his time signing an agreement to work for six months; consequently, a strike of glass workers is impossible, inasmuch as only about 30 per cent. of the employed could, by the simultaneous termination of their agreements, come out at one time. According to the latest mail advices, in the draft report just issued by the Industrial Council it is suggested that a clause should be inserted in all agreements referring disputes to an independent chairman to be mutually appointed, and that all sectional agreements in any particular industry should run concurrently and for a period not exceeding three years. In the shipbuilding trade the men are under a three years' agreement, and they are getting so out of hand under it that they are threatening to strike. It is probable that in its final report the Industrial Council may think well to fix the longest period of agreement at two years; but whatever they do in that direction the draft report contains one wise provision—that the strike must be left as a last resource, that where conciliation machinery exists there should be no intervention, and that there should be an extension of time before a stoppage. The Industrial Council has hitherto had little influence or success in the settlement of trade disputes; but if its latest recommendations are acted upon it will have justified its existence, and done something towards moderating the strike fever that has during the past five years been the curse of British industry, and now threatens the industrial future of South Africa.

ACCIDENTS AND INADEQUATE TIMBERING IN STOPES.

Next to the fight against phthisis, to no phase of Rand mining is more attention now being paid by the mine inspectors than to the reduction in the accident rate. It has been found, on analysis, that far too high a proportion of the accidents in the mines of the Rand results from falls of hanging in stopes, and efforts are now being concentrated on arousing managers and men to the importance of more adequate timbering, both temporary and permanent, to minimize this danger. It is understood that the Acting Government Mining Engineer has taken this matter up with the mine managers, and that he holds very strong views on the necessity for greater attention being paid to this important aspect of underground work. No one who gives the matter two minutes' thought will question the utility to the industry from the economic, not to mention humanitarian, point of view, of reform in this direction. There can be no doubt that as the mines deepen, and the worked-out areas increase, the hanging wall on the Rand is becoming more in need of attention. In practice, with the extension of operations, its excellent reputation is not being maintained, and the sooner our mining men realise the fact the better for the safety of employees and the future of working costs. For obvious reasons the hanging in drives and shafts enjoys strict and adequate attention. Its safety has too immediate and general a bearing on the working of the mine to allow of its being ever for very long overlooked. But in the stopes it is different. Here the need for increased temporary timbering with its corollary, an easily accessible supply of poles is every day becoming more clearly defined. It is not enough that sand-filling has now grown so general along the Reef and that the use of timber has greatly increased. Nor is it enough to object that temporary packs and stulls get blasted out with the round. On examination, these objections are found to be valueless, since the temporary props can be reinserted at the beginning of the following shift. Again, the expense of more liberal timbering and the unwillingness of contractors to spend time on thus safeguarding themselves and their " boys " are urged against the practice. But neither of these can be said to weigh against the growing importance of reducing accidents under this head. They are clearly preventable, and they simply must be prevented by the adoption of the obvious, commonsense methods that obtain in other mining countries. This may not be the best moment for suggesting alterations or reforms, but the only permanent way to allay labour unrest is to so improve conditions underground that such grievances of the men as may be genuine may be removed. The high accident rate on the mines, though due, of course, primarily to the carelessness and inexperience of the men themselves, has doubtless contributed with the phthisis evil, sub-consciously perhaps, to create discontent. It is satisfactory, however, to know that last year's accident rate on the Rand was the lowest on record for the field, and that much of the credit for the improvement is freely given by the Mines Department to the increased efforts of the mine officials in that direction. That, however, should be but an encouragement to redoubled efforts on the part of all concerned. The accident rate from falls of roof must be reduced first of all. The mines must provide more timber and cause it to be easily accessible. The mine managers must insist on the use of the timber so provided, and the preventable waste of life from this cause may thus be greatly reduced in the year to come. The mine inspectors, it is understood, have been instructed henceforth to give this point particular attention, and they will doubtless be seconded in their efforts by all the progressive mine managers on the Reef.

THE DIMENSIONS OF TUBE MILLS.

Important Research Work—The Claims of the Shorter Mill.

Amongst the more noteworthy alterations in Rand metallurgical practice that have taken place during the past two or three years particular reference may be made to the tendency to equip ore reduction plants with tube mills of lesser capacity and lesser length than hitherto. In the past most of the tube mills—in fact all the mills installed on Witwatersrand mines—were 22 feet long by 5 feet 6 inches in diameter. For some years these dimensions were, in fact, regarded as the sizes of " standard " tube mills. All mines under control of the premier mining House of the Rand—the Central Mining and Investment Corporation—for which fine grinding practice was decided on were of this length and diameter.

The Consolidated Langlaagte and Van Ryn Deep Plants.

The most recent equipments installed on the Main Reef series have, however, been 16 feet 6 inches by 6 feet in dimension. The new Van Ryn Deep 80 stamp installation includes eight 16 feet 6 inches by 6 feet tube mills, and the Consolidated Langlaagte 100 stamp plant contains ten mills of this dimension also. Apparently the Johannesburg Consolidated Investment Company has been the pioneer Rand firm in plumping solidly for a smaller size of tube mill, but for some time past there has been a feeling amongst Transvaal metallurgists generally that mills of lesser length than the " standard " 22 feet by 5 feet 6 inches would do more economical work.

Important Tests.

It is understood that exhaustive experiments have recently been carried out at a leading Witwatersrand mine with a view to determining the most efficient and economical size of tube mill. We further hear that these researches have gone a good way towards proving that mills of even lesser dimension than the 16 feet 6 inches by 6 feet tube mills erected at the Consolidated Langlaagte and the Van Ryn Deep will more nearly approach the ideal as regards the combined considerations of capacity, efficiency and cost. It is expected that these tests when concluded will have an important and far-reaching effect on Rand ore reduction methods. It seems probable, at any rate, that in the future such new mills as may be installed on the Witwatersrand will be of substantially lesser length than the " standard " 22 feet by 5 feet 6 inches mill. The view appears to be fairly widely held now that in the larger size tube mills five or six feet of the cylinder may be regarded as so much mechanical waste, having regard to the comparative horse-power costs of the large and small mills.

The Hardinge Mill.

Whilst on the subject of small tube mills we may revert for a moment to a consideration of the Hardinge conical mill. This fine grinding machine seems to be gaining in popularity in America, but on the Witwatersrand it does not appear so far to have met with great success. Some time ago the metallurgical department of the Central Mining and Investment Corporation acquired an 8 feet Hardinge mill for testing purposes at the Village Deep. These tests, it was understood, proved the mill to give efficient results on a fine product, but indicated that it did not give entire satisfaction with coarse particles of ore. It was stated that with screening of 100 mesh the mill did good work, and this mill was afterwards purchased by that company and now forms part of the permanent equipment. Possibly further consideration will be given to its peculiar conical construction and the claims of its patentee if there is any widespread movement for further alteration in the shape and dimensions of tube mills.

POSITION OF THE WEST RAND UNIFIED.

Developments to Date—The New Manager's Report.

A report has just been issued by the West Rand Unified, Limited, for the year ended June 30th, 1913. The capital of this concern is £187,500, divided into 1,500,000 shares of the nominal value of 2s. 6d. each, of which 171,320 shares, representing £21,415, are still in hand for issue. The property consists of 323 claims, and is equipped with a 20-stamp mill. The report refers to the high assays obtained by one set of samples and then goes on to show that the high expectations raised by these were not realised. It may be recalled that a representative of this journal visited the property a few years ago and took samples which gave very poor values. The report proceeds:—

" On the advice of your late consulting engineer, Mr. E. Kunst, various winzes were sunk, and a trench of considerable extent was thrown open, the reef matter from which, a considerable quantity, was to have kept the battery going until further development supplied the further requirements. Meantime a full working staff had been installed, and crushing operations begun. It was, however, soon made patent that the values did not exist in the reefs, and operations were discontinued, the staff being dismissed. Subsequently a prospector, who claimed to have full knowledge of the existence of highly payable reefs on your property, was engaged to locate and point out these reefs, but it was found that he could not substantiate his statements. Your Board then secured the services of your present manager, Mr. McMurtrie, who, by the instructions of your Board, is carrying on certain prospecting work. In the first instance, the cross-cut east from the Penwith shaft was continued with the view of discovering payable reefs, but in this direction, although a reef of 20 in. width was struck, nothing of a payable nature has been encountered up till now. This work is being continued. Some few months ago work was begun on a promising reef outcrop in the extreme southern portion of your claims. An incline shaft was sunk to follow this reef, which is now at a depth of 71 feet, the reef being 30 in. wide. Pannings from this reef vary from 3 dwts. to 8 dwts. in value, the better values being at the deeper level. Further development on this reef is being carried on, with the hope of establishing the continuity of payable values on this line of reef."

Attached to the report is a statement by Mr. A. McMurtrie, the manager, in which he writes:—

" I beg to report having commenced with your company on May 20th, 1913. I immediately began the resampling of your property, wherever reefs were exposed, and found that they carry on an average of 5 dwts., and I think same will show improvement with depth. As already reported, I have been continuing the east drive in the Penwith shaft for 96 feet, the distance previously driven being 202 feet. I have every reason to believe that in this drive I will shortly cut the West Reef, all indications pointing that way. No payable values were found by me in the 202 feet east drive, nor in the 132 feet west drive. The winze near the Cemetery, at the south end of your property, is down 76 feet, and at 71 feet I encountered a 5-foot intrusion, through which I have now passed, and have again struck the reef, with values at 5 dwts. over 30 inches. My opinion is that within a few feet I will again have the full value of 8 dwts. over 30 inches. I suggest that this incline shaft be sunk to a depth of, say, 100 feet, and that I then drive east and west on same, to reach the Government Reef, which I estimate to be 70 feet away. I have no hesitancy in saying that the reef, on which this incline is sunk, is the Main Reef, and that improved values will be found in same, over the entire length of your property. I have made a cutting of considerable extent on your western boundary and found nothing on top of the red dyke. I beg to suggest that the Penwith shaft should be sunk to a depth of 250 feet, so as to prove the values of the reefs at that depth, the present drives having been made at the top of the break, hence the poor values found. These reefs are identical with those at the southern end of your claims, and if proven of payable value at that end they should be the same at the Penwith end."

THE SOUTH WESTERN DIAMOND FIELDS.

Bloemhof-Klerksdorp Alluvial Diggings—How the Men are Faring—Rate of Production over Half a Million a Year—The Principal Finds.

For the first six months of the current year the diamond digging areas of the South-Western Transvaal have produced gems of a total value of no less than £278,410; that is, at the rate of over half a million sterling per annum. It is not a little strange that whereas eighteen months ago the alluvial diamond fields that extend from Klerksdorp to the Cape border were producing very much less than at present, they were then engaging wide attention all over the country, whereas to-day with a much higher output the public are apparently almost apathetic regarding them. No doubt this attitude (in so far as Witwatersrand inhabitants are concerned, at any rate) is largely due to the fact that these fields were "over-boomed" when first the declaration of valuable monthly outputs drew interest to them. Too much was expected of the several farms proclaimed as public diggings. The majority of people appeared to imagine that diamond digging on Mooifontein or London was an easy road to wealth for all and sundry. Experience brought home to the great majority the fact that diamond digging is as great a gamble as roulette, and for everyone who makes a small fortune there must be scores who barely earn the roughest of rough livelihoods. Early last year there was a marked exodus from the fields. Many people who had at the outset made money at Mooifontein and who had put back their profits into other areas lost all their funds and left the diggings heartily sick of things. It became clear that the best "runs" on Mooifontein had been exhausted, but other proclaimed fields came to the fore and the output has been steadily increasing for months past.

The Most Productive Areas.

In close proximity to the town of Bloemhof there has been great activity for several months past, and a number of the more fortunate diggers have been finding very well indeed. The yield from Bloemhof has, in fact, been the largest recorded by any individual diggings of the South-Western Transvaal for the last year. Next on the list, in so far as the June returns are concerned, comes the farm Koppiesvlei and then London, with the Eastleigh area occupying fourth place. For June the figures for these four leading diggings were:—

	Carats.	Value.
Bloemhof	1,585	£8,386
Koppiesvlei	1,130¼	7,176
London	716¼	4,622
Eastleigh	505¼	3,611

The Union Department of Mines does not publish monthly statistics of the numbers of diggers at work, and one cannot therefore indulge in any calculations as to the average finds per man. The population of the diamond diggings is, of course, an ever-shifting one, and figures as to the actual numbers of diggers in any lengthy period are necessarily difficult to obtain. Division of the total output by the number of separate "finds" recorded does not give any reliable results which would indicate the *per capita* discoveries. All the same it is interesting to note that the 1,585 carats, valued at £8,386, declared by Bloemhof were the result of 339 returns. In respect of Koppiesvlei, with an output of £7,176, the returns numbered 129. From London (£4,622) there were 73 returns, and from Eastleigh (£3,611) 66 returns. Next on the list to Eastleigh comes Dievedraai with a total output of 597 carats, valued at £3,187. This digging made 31 returns during the month, of which nine exceeded £100 in value. Vondster is the sixth name on the list, with 628 carats, worth £3,038. A further portion of this farm has just recently been proclaimed for digging.

Other Diggings.

In order of output the remaining productive farms were as follows:—

Farm.	Carats.	Value.		
Rietput	391½	£2,179	15	0
Panfontein	261½	1,612	15	6
Zwartlaagte	166¾	1,195	4	0
Goedgenoeg	200	1,150	0	0
Mooifontein	159¾	860	10	0
Biesjeslaagte	59¾	756	15	0
Maroetjesfontein ...	118¼	737	15	0
Schaapboschdraai ...	80¼	398	10	0
Grootdoorns	64¾	312	10	0
Christiana	56⅝	291	5	0
Kameelkuil	47¾	284	10	0
Diamantdoorns ...	32¾	214	0	0
Schweizer-Renecke ...	48¾	194	12	6
Kromellenborg ...	37¾	175	10	0
Kuilfontein	40½	145	10	0
Zevenfontein	12¼	71	0	0
Vuurfontein	8	52	0	0
Honeyskop	6½	36	0	0
Johannesrust	3¼	26	0	0
Weltevreden	6¼	20	10	0
Mamusa	2½	17	0	0
Blesbokfontein ...	2¾	14	0	0
Amsterdam	3¼	12	0	0
Welgevonden ...	2½	9	0	0
Modderkraal	1¼	9	0	0
Koksrust	2¼	6	0	0
Goedhoep	1	3	0	0
Polochoema	½	2	0	0
Middelbosch	1¼	1	10	0

The total output was thus 7,252½ carats of a value of £43,736.

Rise in Price.

It is noticeable that the value per carat works out at slightly over £6. The eminently satisfactory state of the diamond market and the recent rise in prices has, of course, largely conduced towards larger and more valuable outputs. As an instance of the increase in production and rise in price per carat recovered from the South-Western Transvaal fields, it may be remarked that in May of last year 6,693½ carats, valued at £29,100 were produced; an average of about 87s. per carat. Comparing this return with that of last month, an increase of 558 carats and £14,636, or 33s. per carat is to be noted.

The Largest Stones.

Whilst there are a large number of blanks to be drawn on these diamond diggings, it must be patent that some very substantial prizes are to be won by the more fortunate. Here is a list of the largest stones recovered from the different alluvial areas during June:—

Bloemhof.—Among the stones registered were a 32½ carat, valued at £390; 16 carats, £225; 13½ carats, £162.

Koppiesvlei.—61½ carats, £430; 12½ carats, £220; 15½ carats, £220.

London.—16 carats, £200; 12¼ carats, £158.

Eastleigh.—12½ carats, £205; 9½ carats, £135.

Dievedraai.—22 carats, £220.

Vondster.—32½ carats, £215.

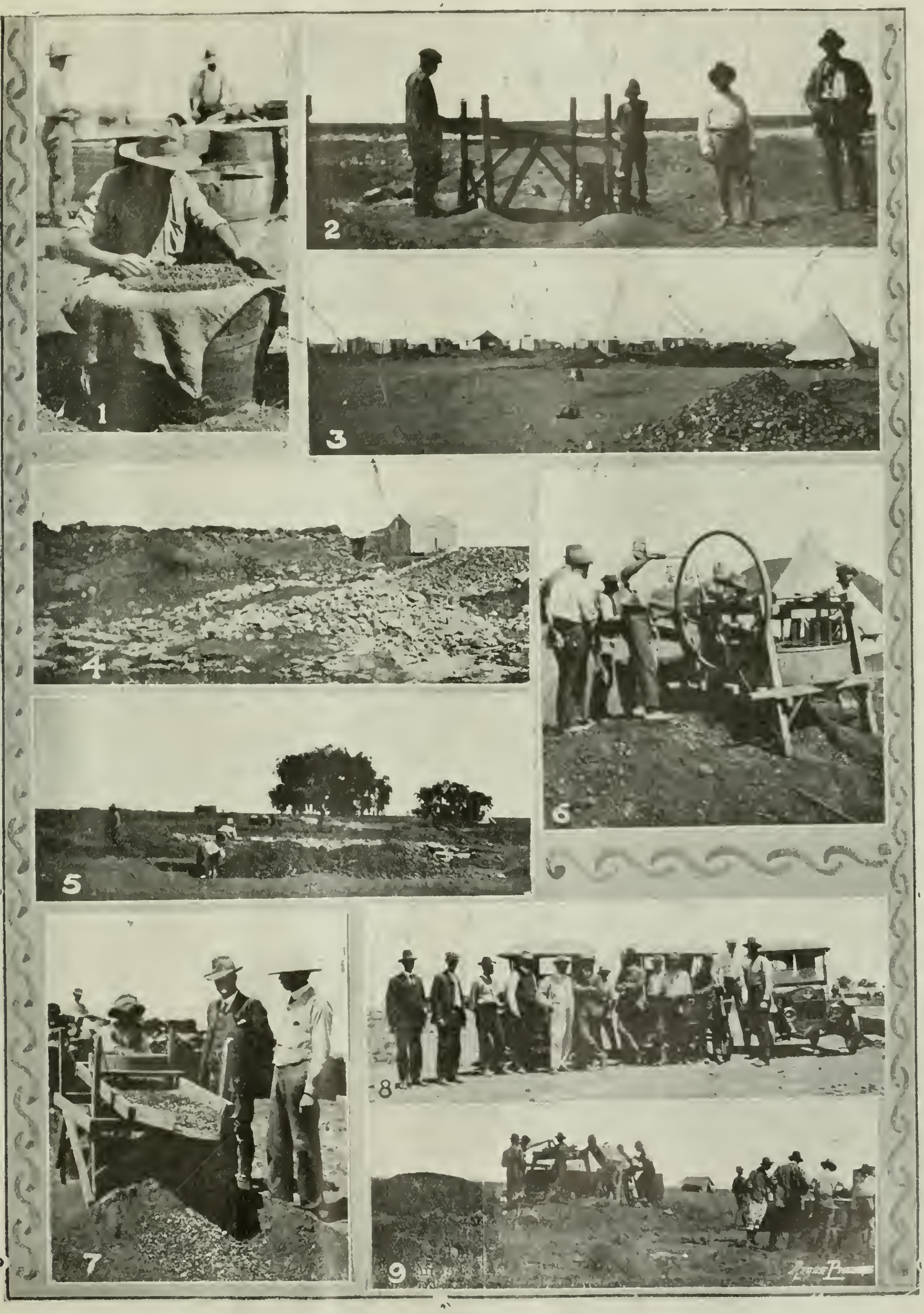
Panfontein.—21¼ carats, £360.

Apparently the largest and most valuable stone found during the month was the 61½ carat diamond from Koppiesvlei, valued at £430.

Koppiesvlei, Koppiesfontein and Schweizer-Reneke.

Koppiesvlei has only recently come to the fore as an alluvial diamond producer. A year ago the returns from here were worth only about £150 per month. Adjoining

TYPICAL VIEWS OF THE SOUTH WESTERN DIAMOND FIELDS.



(1) Sorting. (2) Prospecting and "Babying." (3) A View of Mooifontein. (4) Where some of the First Diamonds were Found on London. (5) Another View of a Portion of London. (6) Washing. (7) A "Baby" at Work. (8) A Group on London at the time of Proclamation. (9) A Pan at Work.

Koppiesvlei is the farm Koppiesfontein, owned by the African and European Investment Company (Messrs. Lewis and Marks). Prospecting work and preliminary washing operations on this farm have given most encouraging results. The first diamonds found on Koppiesfontein weighed 30 carats and were worth £260. It is probable that Koppiesfontein, in common with five other farms owned by Messrs. Lewis and Marks in this district, will have considerable attention bestowed them in the near future. Interest, too, is now extending to Schweizer-Reneke, and, as mentioned in our last issue, a syndicate has just been formed locally with a capital of £16,000 for the purpose of acquiring the discoverers' and owners' rights of the town lands of Schweizer-Reneke.

Points for Prospective Diggers.

Should any widespread " strike " occur in South Africa it is probable that large numbers of people would be tempted to try their luck on the diamond diggings, and to such the foregoing facts and figures should prove of value. Living on the diamond fields of the South-Western Transvaal is not expensive, but the standard of existence is, generally speaking, a low one, and many families are living in the utmost squalor. The equipment of a diamond digger in the Bloemhof area requires but little capital, and the recovery of a very few carats of diamonds per month suffices in most instances to pay expenses. For the rest the life of the digger is a hard and comparatively healthy one. It is a life such as the soul of the born gambler loveth, for any fresh spadeful of ground may contain a Koh-i-noor. But, as already remarked, the really fortunate ones are in the great minority. At present the South-Western diamond diggings are suffering severely from shortage of native labour. In common with other industrial areas of the sub-continent the stoppage of recruiting and the continual wastage of natives returning to their homes is making itself felt in and around Bloemhof.

Strike Clauses in Coal Contracts.

The important judgment of Mr. Justice Pickford in the case of the Cunard Steamship Company, Limited, versus The Denaby and Cadeby Main Collieries, Limited, supplies an illustration of the difficulties which arise from time to time owing to the loose wording of strike clauses in coal contracts, or as in this case, merely referring to the " usual strike clause," without specifying what that clause actually is. It seems strange that in arranging important contracts no more definite terms should be used when, by the exercise of a little care the intention of both buyers and sellers could be made perfectly clear and placed beyond dispute; but as a matter of fact, this ambiguity in regard to strike clauses has been common enough in the English coal trade. Until May last year, for instance, what is known as the London Coal Exchange strike clause, which was approved by the Coal Merchants' Society, the Inland Colliery Owners' Subscription Room and the coal trade section of the London Chamber of Commerce ran as follows:—

> If by reason of any strike or lock-out of the workmen in London, or at the collieries or elsewhere, or any accident over which the contractors shall have no control, they shall be unable at any time to supply the description of coal herein contracted for, the deliveries shall be suspended during such strike, lock-out, or obstruction.

It will be noted that nothing is said as to the interrupted deliveries being made on the obstacle being removed, or whether the quantities in question are to be regarded as cancelled. After the coal strike of last year some disputes arose on this point between buyers and collieries. Where the strike clause was of the ambiguous character in question the arrears were demanded by some buyers on the resumption of operations, with especial emphasis, perhaps, in view of the height of the open market above contract prices, and, in a few cases, delivered. But it was generally understood that the intention of the clause was that the suspended deliveries were to be regarded as cancelled. At any rate, that is the line collieries took, and it was largely accepted by buyers, who were generally of the opinion that if the circumstances had been reversed and the market had gone down, the coal would not have been forced upon them. Indeed, it is a sorry business forcing coal upon an unwilling customer, or for a customer to insist upon the letter of the bond as apart from the spirit of it. Such incidents lead to estranged business relations, and are happily somewhat rare in the coal trade. But it was felt that the strike clause ought to be made more precise in its terms, and the London Coal Exchange clause has been altered accordingly, reading now as follows:—

> In the event of a strike or lock-out of the workmen in London, at the collieries, or elsewhere, or of any other circumstances whatsoever over which the contractors shall have no control, preventing delivery, they shall not be required to deliver the description of fuel herein contracted for during such strike, lock-out, or obstruction, *and the quantity which would otherwise have been delivered shall be cancelled.* The contractors shall not be required to deliver under any item in any one month more than 10 per cent. in excess of the quantity required for consumption in that month unless otherwise mutually agreed.

Collieries which had not already attended to the point have also effected changes which make it quite clear whether deliveries suspended during a strike are to be made afterwards or not. This, of course, is infinitely preferable to leaving the question open for subsequent settlement, since it is always possible that disagreement may lead to litigation.

Effect of Strikes on Trade Union Funds.

The management committee of the Federation of Trade Unions of Great Britain, in their annual report recently issued, express regret that for the third year in succession the expenditure on federation benefit has far exceeded the income from contributions. During the past five years the total income from contributions has been £220,233, and the amount returned direct to the societies affiliated £365,619—an excess of benefits over contributions of £145,386. The committee state that intellectual and economic unrest, the increased tendency towards general strikes and lock-outs, the growth of what are called agreements, but what are sometimes really movements on the part of indirectly affected workers to obtain strike pay as against out-of-work pay, which is usually lower, together with the partial recognition of the sympathetic strike, are responsible for the situation. A careful consideration of the figures shows that on the average approximately 10 per cent. of the membership has received dispute benefit at an annual cost per head of 27s. 7d. To meet such expenditure would require an annual aggregate contribution of £111,411, or an average individual contribution of half-a-crown per member. The contribution suggested, the committee add, may seem huge to those who have expected much for nothing, but after all a contribution which is little more than ½d. per week is a small sum with which to ensure the payment of 5s. per week during strikes or lock-outs. Last year the Federation's income was £78,766, and the total expenditure £96,938, of which Federation benefit absorbed £91,106. The report records a loss of 1¼ per cent. in membership, but says this need not cause alarm or even disquietude. The 41st annual report of the Amalgamated Society of Railway Servants of Great Britain, which is now merged in the National Union of Railwaymen, also contains figures which illustrate the effect of recent labour unrest in depreciating the investments of the society. Of the " trade union," or fighting fund, £48,656 16s. is returned as being invested in railway stock, but at the end of the year this had depreciated to £41,959. The depreciation is most marked in the case of those two companies with which the railway unions have had most trouble recently—the Midland and North-Eastern. In the Debenture stock of the former company the society has holdings of the nominal value of £3,100 16s., but on this the market value was returned on December 31 last as £2,070. In North-Eastern Debenture stock the society has nominal holdings valued at £5,333, but for the same date the market value of this stock was returned at £4,199.

RAND WAGES AND PROFITS.

How the Number of Working Mines would be Decreased by Interference with Existing Conditions.

Amongst the documents attached to the report of the Select Committee on White Labour that was recently issued is the following interesting and timely table, showing the number of mines whose working profit is not sufficient to cover the additional cost of substituting all native employees by whites, assuming two whites equal to three natives. The results are based upon the January, 1913, returns of the 52 Witwatersrand mines whose figures are available.

White labour at	7/6 per shift	10/- per shift.	12/6 per shift.	15/- per. shift.
Number of Mines that would cease to make a profit .. .. (Names annexed).	16	26	35	41
Number of Mines that could continue working at a greatly reduced profit	36	26	17	11

It is of course possible that some of the mines shown as ceasing to make a profit might be able to continue working for a short time by adopting the system of attacking only the richest portion of their ground. Names of mines referred to in above table ceasing to make a profit with white wages at above rates are as follows:—

7/6 per Shift.	10/- per Shift.	12/6 per Shift.	15/- per Shift.
Bantjes.	Aurora West.	City Deep.	City and Suburban.
Cinderella.	Durban Roodepoort.	Consolidated Langlaagte.	New Heriot.
Durban Roodepoort Deep.	Geduld Proprietary.	Consolidated Main Reef.	Robinson Deep.
Geldenhuis Deep.	Knights Deep.	E.R.P.M.	Rose Deep.
Glencairn.	Langlaagte Estate.	Ginsberg.	Village Deep.
Jumpers	Main Reef West	New Kleinfontein.	Witwatersrand.
Jupiter.	May Consolidated.	Nourse Mines.	
Knight Central.	New Goch.	Wit Deep.	
Luipaards Vlei.	New Unified.	Wolhuter.	
New Rietfontein.	Randfontein.		
Princess Estate			
Roodepoort U.M.R.			
Simmer Deep.			
Vogelstruis.			
West Rand Central.			
West Rand Consolidated.			

The mines that could still continue to make a profit (although of course a much reduced profit) with white wages at 15s are:—Brakpan, Crown Mines, Ferreira Deep, Meyer and Charlton, Modderfontein "B," New Modderfontein, New Primrose, Robinson, Simmer and Jack, Van Ryn, Village Main Reef.

Gold Recovery by Volatilization.

A method which is being tried out at the Gwalia Consolidated Mine, in the East Murchison goldfield of Western Australia, for the treatment of refractory gold ores is described by Ben. Howe in the *Monthly Journal* of the Chamber of Mines of Western Australia, December, 1912. The process has already passed the laboratory stage and is running with a small furnace. The results were so good, the extraction varying from 92 to 94 per cent., that a larger furnace is now being erected. The process consists in roasting the ore with a small percentage of salt, whereby the gold is volatilized and passes off as fume. The fumes are led through chambers and drenched with water, which dissolves lime, arsenic and iron salts in the fume and leaves the gold suspended in the solution as a black powder. This water is pumped through a filter press before returning to the chamber to attack more fume. The black gold slime remains in the filter press, from which it can be removed at any time and smelted. Ore as coarse as 20 mesh has been successfully volatilized, but the finer the ore the quicker the volatilization. The salts may be mixed with the ore dry, or the ore may be wet crushed in salt water and subsequently dried. If the ore is given a rough preliminary roast before the addition of salt, 1 to 2 per cent. is sufficient for most ores, but if mixed with the raw ores more salt, say 3 to 4 per cent., is necessary. The furnace used is the simple brick lined rotary type, without ribs or other projections inside, with a constant feed at one end and a discharge at the other. The temperature required is about 1000° C. A higher temperature than this sinters the ore. This is no disadvantage if it occurs at the discharge of the furnace, but if too high a temperature is carried back into the furnace the ore sinters at this stage and volatilization ceases before the ore is ready for discharge. A low temperature is fatal to good results, as little action seems to take place below a bright red heat. It is advisable to use oil or gas firing in the furnace, because the temperature is more easily under control and because the fuel, under this mode of firing, gives no soot. The water used in breaking down the fumes becomes charged with sulphurous and a little hydrochloric acid, both of which are helpful in taking the salts of the base metals into solution. Owing to the constant circulation of water, no great heat is experienced in the breaking down chambers, and wood can be used in their construction. In concluding, the author states his belief that this method of gold recovery will cause radical changes to be made in many Australian reduction plants. All ores carrying small quantities of arsenic calcite and other minerals present in most ores on these fields are amenable to treatment. All ores of this category, whether oxide or sulphide ores, whether antimonial or cupriferous, whether graphitic or telluride ores, readily yield up their gold by volatilizing with salt. In discussing this method in the May number of *Metallurgical and Chemical Engineering*, H. C. Parmelee calls attention to the fact that in 1897 or 1898, Edwin C. Pohle and Stuart Croasdale, then respectively chief assayer and chief chemist for the Globe Smelting and Refining Co., Denver, Colo., devised and patented a process based on the same principle as that suggested by Mr. Howe. These investigators found that gold, silver, lead and copper could be almost completely volatilized from most ores. It was necessary to have in the ore some form of sulphide in proper proportion to react with the added sodium chloride. The reaction liberated nascent chlorine, which combined with the metals to form volatile chloride. If the ore contained a high percentage of sulphide, it was first partly roasted; if it contained none or not enough, raw pyrite was added. The laboratory tests were simple so far as volatilization was concerned, but recovery was a different matter. The process was finally worked in an experimental plant in Denver, and later a commercial plant was erected at Mayer, Ariz. The latter was never operated. The stumbling block to success was the recovery of the volatilized chlorides. Bags, sprays, solution towers etc., were tried at the recovery end, but without success. The problem was never satisfactorily solved. The volatilization feature, however, was attractive in regard to refractory ores, for they usually yielded to the treatment. Mr. Parmelee suggests that the one possible solution of the recovery problem is by the Cottrell method of fume condensation by means of a high-potential electric discharge. The volatilized metal chlorides might be suitably condensed by this process.

HELPING TO SOLVE THE PROBLEM OF HUMAN ENGINEERING.

How to Maintain Industrial Peace—The Industrial Service Movement—Getting at the Heart of Labour Troubles—Some Thoughts for the Times.

By Fred. H. Rindge.

In a recent engineering article in the American Year Book, William Kent, an expert in such matters, says:—"Formerly an engineer's chief work was finding how to do things with materials of construction and with the forces of nature. Now it is how to do things in a larger and better way, with greater economy of fuel and other material and of time and labour. Conservation of resources, saving of waste products, organization, system and efficiency are now the watchwords of the engineer. He has become a business man, a political economist. The new development has given rise to new definities of engineering, such as 'making one dollar do the work of two dollars,' 'overcoming the resistances of nature—including human nature, and to a new specialization by an as yet small group of consulting engineers who have been variously styled 'efficiency' engineers, and 'scientific management' engineers, etc." Mr. George E. Emmons, general manager of the General Electric Co. in Schenectady, N.Y., says:—"I keep closely in touch with general shop conditions. As far as practical, all important labour needs which are likely to reach an acute stage and possibly precipitate trouble, are promptly brought to my attention. I have found that in most cases, trouble with help can be avoided by a frank talk with the interested individuals. Every employee in the plant has access to me, and I endeavour to treat all complaints without prejudice." Another expert on this problem has perhaps hit the nail on the head when he remarks: "There are all sorts of people in the world, but whatever may be the cork-screw twist in some natures, the human basis must be the starting point of every effort that human beings make to get together." With these things in mind, it is undoubtedly interesting to note that many engineering students are graduating with a splendid technical equipment, but with very little knowledge of how to handle working men sympathetically and intelligently and in a way to get results with the avoidance of labour difficulties. Realizing this need for service in the industrial world of to-day, there has come into being the Industrial Service Movement among colleges. This Movement enlists engineering students on the one hand in various forms of volunteer service for industrial workers on the other, to the mutual advantage of both. The Movement started six years ago at Yale University, and at the present time 3,000 students from 150 colleges are rendering volunteer industrial service under the auspices of the Young Men's Christian Associations. Other students are finding opportunity to render this service where they live or work during the summer months. 3,000 graduates who become interested in college are now promoting the ideas and ideals of the Movement in their larger spheres of influence. Employers, engineers, labour leaders, professors, social workers, and many social agencies are co-operating in the work. The whole thing is looking towards the enlargement of the human side of the engineer's job. Some of the interesting services which are being rendered by engineering students is well illustrated by the following: Students from the University of Illinois, Indiana, Iowa, and Ames, are teaching foreign men and boys in railroad box cars. Men from Columbia, Harvard, Williams, Brown, Knox, Northwestern and other colleges are teaching educational classes in labour unions, talking in shop meetings, or leading clubs of working boys. University of Wisconsin engineering students are instructing American mechanics and boiler makers in the Round House. Prominent undergraduates of Amherst, Massachusetts Agricultural College, Princeton, and Penn. State, are doing deputation work in rural industrial communities. Men from Cornell, Worcester Polytechnic Institute, McGill University, California and the University of Puget Sound are visiting the homes of immigrants and are teaching groups in boarding houses. Students of South Carolina, Furman, Jacksonville Normal and other southern colleges, are doing extension work in cotton mill villages. Leaders from Universities of Pennsylvania, Pittsburg and Wisconsin are instructing convicts in the jails. The old Yale house is now used as a school for English, civics, and hygiene to foreigners. Why are students working? First, because their sympathy and desire to serve those less fortunate has been awakened. Second, they have been shown a real job to do and how to do it. Third, they have realized that service "blesseth him that gives and him that takes" and have therefore acquired a vision, enlarged sympathy, understanding of "the other half," and an experience which is proving valuable. Recently at the University of Iowa, the Movement was presented to a faculty meeting which had not been addressed by any outsider for nineteen years. A number of college faculties have met to discuss the Movement and to consider the re-adaption of the engineering courses to give more attention to the "human side of the engineering profession." Already many engineering schools have courses in management, etc., but professors are coming to feel increasingly that even these courses have too much of the "material" and not enough of the "human" element. Such instruction, supplemented by personal friendly contact in service for industrial workers, will do much to remove prejudices and promote mutual understanding between college men and working men. An engineer said to me recently: "Two college men of equal training worked in my shop last summer. One of them 'knew it all,' was despised by the men, and got fired. The other became 'one of the men,' and learned from them, and nearly every evening some of the working men went to his room and he helped them in mathematics, mechanics, plain reading, etc. That fellow has a big job waiting for him because he learned how to handle men to advantage." What do students accomplish? A partial answer to this question has been already given. The Movement advocates any kind of helpful service for industrial men and boys that affords friendly personal contact, such as teaching English, history, and citizenship to foreigners; classes in drawing, electricity, manual training, music and other subjects; men's and boys' clubs; boy scouts, big brothers work, noon shop talks in factories; instruction in hygiene and first aid, athletics, etc.; educational classes in labour unions; socials, entertainments, observation trips and week-end camps; charity organization work; investigations of working, living and recreative conditions, etc. Even more than these things the students are breaking down the natural prejudice which working men may have, and they themselves are coming to understand and appreciate the industrial workers as never before. Why are engineering students especially interested? The question is peculiar for social workers in our colleges have in most instances found engineering students "too busy," and as a rule not so open to the altruistic appeal as those in other departments. Yet, it is a fact that eighty per cent. of the 3,000 engaged in industrial service are engineers. The reason is obvious: A football captain, an engineer, said the other day, "This industrial work is the livest thing that's struck college since I've been here. It's a real job and it's practical. Everyone of us who goes into it is bound to acquire an experience in dealing with men, which the curriculum can't give, and we need it!" Indeed a prominent general manager, himself a college graduate, recently said to the writer: "The college graduates in my employ are frequently a confounded nuisance. They come to us with a splendid knowledge of books, but when as foreman or superintendents, they get out into the shop, and deal with working men, they make a mess of it. A good part of my time is spent in straightening out difficulties and restoring harmony." When asked where the fault lay he replied: "They haven't any real sympathy with them and don't know how to handle them." Here then is a great need in the training of an engineer, which the Industrial Service Movement is designed to meet. Engineering students are quick to see the point. As they teach English to foreigners or lead a club of working men they come to understand men, not as a "class," but as individuals. They get a friendly insight into their working and living conditions and a first-hand knowledge of how to deal with them intelligently and sympathetically. It is also true that many a college man has been kept straight and acquired higher ideals because of the responsibility of some group of men or boys who were looking up to him.

What is the larger significance of the Movement? As already indicated, after students have had a real service-experience, their changed attitude toward the world's needs and their sense of responsibility is bound to lead to greater activity in their larger spheres of influence after graduation. Thus, it is not surprising that we have in our central office a mailing list of over 3,000 graduates, most of them engineers who were interested as undergraduates, and many of whom are now in the forefront of the movement for social and industrial betterment. One of America's greatest football captains, a few months after graduation, wrote from a construction camp in Colorado: "Remembering what I learned in this Movement at Yale, when I became foreman I treated my gang of Italians as men and not as dogs, and it was really pitiful to see the way they returned the little kindnesses I showed them. Each day I was met with cheery words of greeting. When the job was completed the men came to me in a bunch, thanked me for the fair way I had treated them and said they would like to work for me always." What greater satisfaction could an engineer ask? And what may it not mean to the industrial world of to-morrow, as hundreds and hundreds of engineering and other students graduate from college with a new vision of their service opportunities, and a knowledge of how to help. In one college town, all last winter, the son of a railway magnate, who has 25,000 men under him, taught a group of foreign labourers in one of the worst districts of the city. Who can judge of that man's influence a few years hence? This in brief is the story of the Industrial Service Movement, which heads up in the Industrial Department of the Y.M.C.A., International Committee, in which State Committees and three hundred students and City Associations co-operate. Briefly stated, at a conservative estimate, 3,000 undergraduates are now reaching 60,000 working men and boys each week in definite constructive service. No one can measure the helpful service of the 3,000 graduates who also are promoting the ideals of the Movement. Thus, quietly, but rapidly, without undue advertising, is advancing a great Movement, broad in its scope, submerging creed and class in patriotic and altruistic service; deep in its influence, reaching to the very heart of many vital industrial problems of to-day. As hundreds of college men continue to graduate with a new vision of their service opportunities and responsibilities, who can judge of their influence in years to come in maintaining industrial righteousness and industrial peace"

Technical Education.

The National Advisory Board for Technical Education has been discussing industrial schools, trades schools, and similar subjects. The board has received replies from employers and others interested to the circulars of inquiry as to the demand for skilled artisans and apprentices. The board states that the replies were not only of great value but were evidence of the interest taken in the matter throughout the country. From the information obtainable from the replies to the circulars, it is not possible to say which trades provide the best prospect of employment and remuneration. There appears, however, to be a general desire for the properly indentured apprentice in nearly all the skilled trades throughout South Africa. The Inspector of White Labour says the following are the principal forms of technical, in the sense of trade, training which are likely to be effective:—

(a) Apprentices in a workshop, supplemented by attendance at evening classes of a general and technical character; (b) training in a trades school, followed by apprenticeship in a workshop; (c) a possible variation would be apprenticeship in a workshop together with compulsory attendance at day classes on one or more half days in the week.

With regard to technical, in the sense of trade, training—

(a) Pupils should be required to have satisfactorily completed the fifth standard course and have attained the age of thirteen years before being admitted to a trades school; (b) apprenticeship should not, as a rule, extend beyond the attainment of the twenty first year of age; (c) it should not as a rule be of less than five years' duration: this period should include the period recognised in virtue of training in a trades school [*vide* sub-section (*d*)]: (d) the period of training spent in a trades school, excluding any period of probation, should be recognised, and the period of workshop apprenticeship be reduced, in consequence of the trades school training; (e) trades school training should in all cases be followed by workshop apprenticeship; (f) admission to technical evening classes should only be granted to pupils who are able to profit by the instruction given.

When the system of apprenticeship, supplemented by evening classes, is followed, an apprentice should not, as a rule, be allowed to enter into indenture until he has satisfactorily completed the sixth standard course; and this is the standard which should usually be required, and which can, in the majority of cases, be insisted upon. The case of a boy whose education has been neglected, and who might be debarred by the above standard from apprenticeship, should, for the present, be considered on its own merits.

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NATIVE MORTALITY ON THE MINES.

A Puzzle for Doctors—Comparisons in Native Mine Mortality.

The report of the Native Affairs Department for 1912 (says the *South African Medical Record*) not only brings out, as we all, of course, knew it would, the very severe special liability to disease of the tropical natives, whose recruiting has quite rightly been prohibited, but it also demonstrates some differences, hard to explain, between the respective mortalities of tribes south of the line of latitude 22. These differences are shown by the table below, which gives the actual numbers at work, from each of eight territorial divisions, with the mortalities per mille. It is important to note the numerical figures, because, obviously, statistics drawn from large numbers are more suggestive than those from small ones, in which some accidental circumstance may bring about vitiation.

	Natives.	Death-rate per 1,000
East Coast	75,938	29·6
British Bechuanaland ...	2,451	29·0
Basutoland	10,000	22·5
Swaziland	4,104	18·8
Transvaal	25,269	15·8
Cape Province	61,938	11·6
Natal and Zululand	17,971	11·5
Orange Free State	1,243	9·7

It is perhaps necessary to point out that "East Coast" means Portuguese territory south of latitude 22, also that, for practical purposes, "Cape Province" means the Transkeian Territories and those portions of the Cape immediately adjacent thereunto. The most noticeable features of the table are the very low mortalities of the Cape Province, Natal and Zululand, and the Orange Free State, and the high mortalities of the East Coast, Bechuanaland and Basutoland. It is quite easy to understand the high positions of the East Coast and of British Bechuanaland, in the former case because of the climatic environment, which is low-lying and sub-tropical, and in the latter because of the low physique of the Bechuana, and the extent to which they are soaked with syphilis. It is also easy to understand why, to a certain extent, the Cape, the Free State, and in a less degree Natal and Zululand, should take a low place, because of the less extreme climatic environment, but not so easy to explain why the position should be as low, comparatively, as it is. And again, the somewhat high position of the Transvaal may, possibly, be partly explained by the facts that recruitment for the mines is almost entirely carried on in the unhealthy northern Transvaal, and that there again there is a good deal of physical deterioration due to syphilis. But one is perplexed to find an explanation, at least on racial or climatic grounds, of the notably high mortalities of the Swaziland and Basutoland labourers, more especially as we are given to understand that the Basuto are largely employed on the surface. Both these races are of fine physique, and both hail from climatic surroundings which certainly should not predispose them to pneumonia, which is the principal factor in the mortality causation. One broad explanation of the low position of the Cape and Natal labourers may possibly be found in the fact that they are both of pure Bantu stock, which cannot be said of any of the others, saving of the East Coast men, who are handicapped by their climatic environment to an extent which possibly counterbalances the racial advantage.

MANY FACTORS.

We should very much welcome in our pages the opinions of those of our confreres, of whom there are many, in a position to speak with authority on the very interesting points raised by these figures. It seems to us that no one factor can altogether explain them, and there must be a more or less complicated interplay of various factors of race and environment, reinforcing or neutralising each other. One point strikes us at first sight, and that is that the natives of the Cape Province and the Free State are notable as being far more markedly than any of the others civilised and assimilated to the European in their modes of life, a fact which, at any rate, goes to disprove the oft-repeated assertion that "to Christianise and civilise the native spoils him." These influences certainly cannot "spoil" him physically, or these Provinces would have been very high on the mortality list. But this explanation, again, will only partially account for the fact of Natal and Zululand occupying a position practically identical with that of the Cape Province, because, although these people are more civilised than, say, the Swazis or the Northern Transvaalers, they are certainly not more civilised than the Basuto, who occupy a very high place. Of course, they are far less Europeanised than their brethren in the Transkei. The comparison between the Cape and Natal people, again, may be somewhat vitiated by the fact that we are dealing with widely different numbers in the two cases. It may be here that we have the favourable factor of greater Europeanisation (if it be, as we think, a favourable factor) in the Cape case, counterbalanced by some other favourable factor, perhaps the Zulu physique, in the other. Or possibly, to some degree, some influence may be credited to the fact that the Zulus, to a greater extent than even the Basuto, are very largely employed above ground. Another possible factor may be that the Transkeian "boy," especially if he be a Fingo, is much keener on hoarding his money than the Zulu, and may perhaps deny himself useful luxuries on that account and set more store on the premium wages for drilling extra holes, on that account overworking himself to a greater extent than the more easy-going man from Natal. Again, another point has struck us as having a possible bearing in favour of the Transkeian "boy." We write subject to correction which we hope will be forthcoming if necessary, but from what we hear we fancy that the very excellent plan of having boys medically examined before they are recruited has been carried out much more generally in the Transkei than elsewhere.

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PROGRESS ON BARNATO MINES.

Results for the June Quarter—Some Excellent Returns—Position at Productive and Developing Mines.

Reports of the seven producing and two developing mines under the control of the Johannesburg Consolidated Investment Company for the quarter ended June 30th last are now to hand. In each instance satisfactory results are recorded. With regard to milling propositions the milling results are briefly summarised as under:—

Company.	Tons Milled.	Revenue £	Revenue Per Ton, s.	Cost Per Ton. s.	Gross. Profit. £	Ore Mined. Tons.	Ore Developed Tons.
Cons. Langlaagte	144,450	191,834	26·561	17·197	67,632	152,583	162,932
Ginsberg	45,580	62,547	27·145	19·546	18,591	64,690	39,028
Glencairn	63,355	46,557	14·697	12·848	8,140	74,229	36,260
New Primrose ...	77,190	107,631	27·956	13·467	57,202	80,911	47,947
New Rietfontein .	47,870	53,180	22·218	19·639	7,680	55,610	36,638
New Unified ...	37,335	47,901	25·660	17·693	15,476	44,729	35,911
Witwatersrand .	113,300	151,925	26·818	14·997	72,264	133,543	126,855

Outstanding features at individual mines are as follows:—

Consolidated Langlaagte.

With the exception of the week-end stoppages the mill ran without interruption, with the result that the tonnage crushed was increased by 19,140 tons as compared with the quantity milled during the preceding quarter. Working costs were reduced by 1s. 5d. per ton, and the gross profit shows an increase of £12,401. The sinking of the east incline shaft was hampered by water, and arrangements are now being made to instal a pumping station at the eighth level. Preparations have also been made in order to resume the sinking of the west incline shaft. Satisfactory results are being obtained from the development of both the South Reef and Main Reef Leader at the east shaft, but the values exposed at the west shaft continue poor. The payable ore reserves were increased during the quarter by 27,952 tons.

Ginsberg.

The results for the quarter were adversely affected by a fluctuation in the grade which was experienced in April. That the fall was only of a temporary nature was shown by the fact that the profit improved in May and was back to its former level in June. The quantity of ore crushed was increased by 2,450 tons, and there was a small reduction in working costs. This compensated to some extent for the decrease in the revenue from gold, which was about 2s. per ton lower. The tenth level station at the north shaft was cut, and the drive east has been started. The ninth drive east continues to expose reef of good value. The erection of the accumulated slime treatment plant made good progress, and it is expected that it will be put into operation before the end of the current quarter.

Glencairn.

Working costs were reduced by about almost 10d. per ton, and the quantity of ore milled was increased by 1,869 tons, as compared with the returns for the previous quarter. On the other hand, the grade was slightly lower, so that the gross profit showed an increase of only £245. A fair quantity of payable reef has been exposed as a result of the development operations in the Knights Tribute Section.

New Rietfontein.

It was found possible to effect further economies in the running of the mine, and as a result working costs were reduced by over fourpence per ton as compared with the previous quarter. Unfortunately, the grade of the ore mined showed a further downward tendency, so that the gross profit was lower by £1,452. No. 1 shaft was sunk 87 feet to a total inclined depth of 1,728 feet. The development from this shaft has recently been more encouraging.

New Primrose.

The quantity of ore crushed was increased by 3,400 tons, as compared with the previous quarter. This was largely due to the increased efficiency of the tube mill plant, which ran without interruption. There was a marked improvement in the percentage of gold recovered, the value of the residues having been reduced to under ·25 dwt. The gross profit shows an increase of £723 as compared with the profit for the three months ending 31st March, 1913.

New Unified.

There was a further reduction in working costs of 1s. 4d. per ton milled, and this has permitted of a larger percentage of low grade ore being worked at a profit. The grade was reduced by 1s. 2d. per ton, and as the quantity of ore milled was higher by 1,445 tons than that crushed for the previous quarter the gross profit showed an increase of £603. Since the beginning of the year there has been a steady reduction in the percentage of Main Reef Leader mined, and a corresponding increase in the quantity of South and Main Reef. Development operations on the South Reef continue to yield satisfactory results, and there has been practically no depletion of the ore reserves.

Witwatersrand.

The results of the quarter's operations were of a very satisfactory nature. The tonnage crushed was lower, but the grade of the ore showed an improvement to the extent of 1s. 3d. per ton, and as there was very little alteration in working costs the total gross profit was higher than that for the preceding quarter by £4,454. The bulk of the development was carried out at the head of the southern section, and the reef exposed was most encouraging both as regards its width and value. The main winze, which is being put down from the 14th level to connect with the cross-cut from the vertical shaft, has attained a depth of 369 feet, and has exposed reef of exceptionally good value. The sinking of the southern incline shaft was stopped during the quarter to permit of the cutting of the necessary stations, engine chamber, and bins. This work was advanced sufficiently at the end of June to permit of shaft sinking being resumed. The foundations for the new tube mill plant and additional cyanide plant were completed, and the tube mills and tanks are delivered on the mine. The work of erection was being taken in hand.

GOVERNMENT AREAS (MODDERFONTEIN).

Shaft Sinking.—South-east shaft: This shaft was sunk 312 feet during the quarter, attaining a total depth of 3,684 feet. The reef was struck at a depth of 3,579 feet on the 21st May. The average width of reef was 57 inches, and the average value 16·5 dwts. The main station was cut in 22 feet, the lower pump station was cut in 8 feet, the temporary ore bin was cut and timbered, and the front of the permanent ore bin was cut in 12 feet. 46 feet of sinking is required to complete this shaft. South-west shaft: This shaft was sunk 410 feet during the quarter, and attained a total depth of 3,376 feet. The shaft passed out of dyke at 2,975 feet, and has been in quartzite from that point. A heavy stream of water was struck on the 29th June, the water baled increasing from 220 skips to 700 skips per 24 hours.

Development.—North-east shaft: The total footage driven, risen and sunk during the quarter was 3,065 feet, of which 1,499 feet were on payable reef, averaging 18·6 inches width and 14·0 dwts. value. 958 feet were on unpayable reef, averaging 10·2 inches width and 10·2 dwts. value; and 608 feet were off reef. North-west shaft: The total footage driven, risen and sunk during the quarter was 4,179 feet, of which 1,632 feet were on payable reef, averaging 25·1 inches width and 11·6 dwts. value. 1,208 feet were on unpayable reef, averaging 13·7 inches width and 7·3 dwts. value; and 1,339 feet were off reef.

Surface Equipment.—The erection of one 50-drill compressor and two Babcock & Wilcox boilers is proceeding at the north-west shaft, and a similar equipment at the south-east shaft. Six blocks of single rooms, containing 24 rooms, were completed during the quarter. Eight semi-detached houses are in course of erection, and will shortly be completed. The capital expenditure during the quarter amounted to £85,289 1s. 5d.

VAN RYN DEEP.

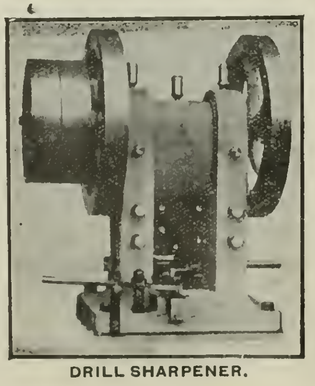
No shaft sinking was carried on during the quarter. The development results for the quarter were very satisfactory. The total footage driven, risen and sunk amounted to 4,674 feet, of which 2,355 feet were sampled, giving an average assay value of 19·2 dwts. over 25 inches. Of the footage sampled, 2,085 feet were payable, and of an average value of 22·4 dwts. over 24 inches, and 270 feet unpayable at 4·1 dwts. over 22 inches. The payable ore reserves were increased by 180,744 stoping tons of a value of 11·3 dwts. over 48 inches, bringing the total payable ore reserves to 1,667,088 stoping tons of a value of 8·0 dwts. over 51 inches. Assuming 15 per cent. sorting, this would bring the milling tonnage to 1,417,025 tons of an average assay value of 9·4 dwts. The unpayable reserves at 30th June amounted to 614,608 tons of an assay value of 2·9 dwts. The development footage is lower than last quarter owing to the opening up of stope faces. The erection of the reduction plant was practically completed by the end of June. Unfortunately, on account of the strike, all work on the mine was stopped on the morning of the 30th June, and work was not resumed until the 9th July.

Mill Fires and their Prevention.

The statistics of Germany, South Africa and Australia show that thirty-three mills were burned during the year of 1911, while more than forty were destroyed by fire during the same year in the United States and Mexico. The chief reason for this difference (says the *Mexican Mining Journal*) is due to the fact that the first-named countries now largely use steel framework, reinforced concrete floors and walls with corrugated iron roofing, whereas the other two Republics still construct their mills with timber with corrugated iron roofs and sidings. The higher first cost of the concrete and steel construction is justified by the fact that its term of life is far greater than the old methods, and the depreciation in utility and value is less than 1 per cent. per year. Recently the State of Nevada has made considerable progress in the use of fire-proof construction in the erection of new mills, such as the new Belmont mill at Tonopah, the Nevada Consolidated at McGill, the Goldfield Consolidated and several others. The above statistics show the importance of providing for an efficient fire protection in the designing of mills, a feature which is sadly neglected as a rule. When a manager says that the property is fully insured, how near the truth is he? No insurance will protect the owners from a loss of income for several weeks or months, while rebuilding the mill. Since the question of economic operation is dependent upon the continuous running of the mill, it is of the utmost importance to prevent a loss of working time caused by fires. With all fires the responsibility is greatest during the first five minutes, for at the start all fires are of the same size and could be easily extinguished were the proper means at hand. Every mill superintendent should consider the possibility of fire and have a well-defined plan of action and a few of the crew trained for emergency. This will prevent confusion and enable the entire mill crew to perform "team work" which is so effective in all lines of work as in the sports. A sign something like the following will prove effective in arousing men to the realisation that their livelihood is dependent on fire prevention:

A FIRE
IN THIS MILL MAY PUT EVERYONE OUT OF WORK.
GUARD THE PROPERTY AGAINST FIRE AND PROTECT
YOUR POSITION.

Notice is given that the Minister of Mines, under the powers vested in him by section 2 of the Miners' Phthisis Act, 1912 (Act No. 19 of 1912), has withdrawn the undermentioned mines from the list of mines published under Government Notice No. 1028 of 1912 in the *Union Gazette*, dated 30th July, 1912, viz.:—Witwatersrand Gold Mines: Randfontein Deep, Ltd.; East Rand Extension Gold Mining Co., Ltd.; Van Dyk Proprietary Mines, Ltd.



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Rhodesian Section.

LATEST MINING NEWS.

Exploring Lands and Minerals—Wanderer G.M. Co.—Bechuanaland Exploration—Rhodesia, Ltd.—Globe and Phoenix Developments—Eldorado Banket—Golden Kopje.

THE report of the Exploring Lands and Minerals Company for 1912 states that the expenses have been met out of revenue. The directors, however, have written off the total expenditure incurred in investigating and working several properties held on option which did not turn out satisfactorily. As against this, however, the directors point out that there is a very large unrealized profit on the company's Nigerian interests, which will far more than cover the loss written off this year. The directors consequently consider they are now in a position to carry out the distribution of shares in the Ex-Lands Nigeria (Limited), and they therefore propose to submit to the meeting a resolution declaring a bonus payable to the shareholders in fully paid shares of the Ex-Lands Nigeria. The liquid assets at June 12, 1913, were as follows: Cash at banks, £5,683; cash on loans against security, £33,666; debentures and shares immediately realisable, £18,361, or a total of £57,710.

* * * *

The consulting engineer to the Wanderer Gold Mining Company cabled his principals in mail week to say that the Camperdown section of the property, which he reported on May 5 was to be shut down at the end of that month, has now been tributed.

* * * *

A cable from London on the 8th inst. announced that the report and balance sheet of the Bechuanaland Exploration Company has been issued. The accounts show a net profit for the year of £7,616, and the directors recommend a dividend at the rate of 4 per cent. per annum, the same as the previous year.

* * * *

Rhodesia, Ltd., cablegram:—During May 147 ft. of development have been accomplished at the Sabiwa mine. Shaft No. 4 has reached No. 4 level; driving in both directions started; expect reef will be intersected during month of June. Third level drive south winze to 4th level down 55 ft. below No. 3 level; last 15 feet averages 10 dwts.; third level drive south extended 26 ft. during the past month—total 365 ft. No. 10 crosscut has been extended 9 ft., a total of 12 ft., average assay value 17 dwts.; crosscut still in reef. Outlook in southern section of mine has improved considerably; second level drive north and third level drive north in broken formation, but reef has widened out again in second level drive north to 3 ft., carrying good value.

* * * *

The following shows the developments on the Globe and Phoenix mine during the month of May, 1913:—New main shaft, total depth, 930 ft. No. 12 level, station reef, intermediate drive north from No. 1 winze south has advanced 54 ft.; average width of reef, 11 ins.; average value over 30 ins., 3 dwts. 12th level drive north No. 1 crosscut east drive south from crosscut has advanced 8 ft.; average width of reef, 22 ins.; average value over 30 ins., 2 dwts. 12th level drive north, No. 1 crosscut, east drive north from crosscut, has advanced 57 ft.; average width of reef, 10 ins.; average value over 30 ins., 20 dwts. 12th level drive north, No. 1 crosscut, east No. 1 rise, has advanced 7 ft.; average width of reef, 9 ins.; average value over 30 ins., 3 dwts. 18th level, west portion, No. 1 winze on footwall reef has advanced 15 ft.; average width of reef, 17 ins.; average value over 30 ins., 8 dwts. 18th level, west portion, No. 1 raise on footwall reef has advanced 29 ft.; average width of reef, 14 ins.; average value over 30 ins., 7 dwts. 19th level, drive north from No. 2a winze (prospecting on line of combined reef) has advanced 40 ft.; average width of reef, 18 ins.; average value over 30 ins., 26 dwts. 19th level, east portion, drive north from 1a winze, No. 1a rise has advanced 36 ft.; average width of reef, 17 ins.; average value over 30 ins., 13 dwts. 19th level, No. 1 winze north 19th-20th level west reef has advanced 15 ft.; average width of reef, 8 ins.; average value over 30 ins., 2 dwts. 20th level, drive north, from No. 1 winze 19th-20th levels, has advanced 35 ft.; average width of reef, 13 ins.; average value over 30 ins, 35 dwts. 20th level, drive north, from No. 2 winze 19th-20th levels, has advanced 38 ft.; average width of reef, 25 ins.; average value over 30 ins., 18 dwts. 20th level, drive south from No. 2 winze 19th-20th levels, has advanced 64 ft.; average width of reef, 14 ins.; average value over 30 ins., 22 dwts. Crosscutting for the month, nil.

* * * *

From the report of the Eldorado Banket for the three months ended March 31st:—The estimated balance of net profit, after deduction of two interim dividends, and subject to the customary allowances for depreciation on plant, buildings, etc., amounted at March 31st to approximately £76,000, including gold in reserve. Development—Length of pay shoots—Levels 1, 2, 3, 4, 5, 6, 7, 8 and 9, remain unchanged since last report. No. 10 level (vertical depth 1,164 ft., incline depth 1,297 ft.): Development on this level has been continued through E-11 main winze at 314 ft. east of shaft. The main drive east has advanced from 96 to 221 ft. east of E-11 winze, a distance of 125 ft. The average assay value from 96 ft. to 116 ft. is 18·9 dwts. over 72 ins., or 15 dwts. with high values reduced. From 116 ft. to 221 ft. east the value is 1·6 dwts. over 72 ins. E-1J main winze, below No. 10 level, has been commenced at a point 110 ft. east of E-11 winze and sunk 34 ft., with an average value of 8·8dwts. over 72½ ins. Vertical shaft—During the period under review further satisfactory progress has been made in securing this shaft. The work was all far enough advanced to permit of sinking being resumed on February 12th, since which date the shaft has been sunk 69 ft. Total depth, 980 ft. There now remains 46 ft. of sinking in order to reach No. 9 level. At the tenth level the length of pay rock exposed is 105 ft.; value, 17·9 dwts. (reduced values); width exposed, 7 ft. 4 ins.

* * * *

The report of the Golden Kopje Proprietary Mines, Ltd., for the period to March 31 last, states that at that date the ore reserves were estimated to total 255,238 tons, with an average assay value of 7·3 dwts. In addition there were partially developed on the Golden Kopje section 14,000 tons of an average assay value of 6·5 dwts., and the Union Jack section 41,508 tons, of an average assay value of 13·61 dwts. The grand total of ore reserves may be taken to be 310,746 tons, of an average assay value of 8 dwts. The balance sheet shows that, including £7,550 sundry debtors, the company has cash resources amounting to £91,961, of which actual cash at bankers is £7,251.

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Engineering Notes and News.

Air Cylinder Lubrication.

The following, relating to the method of lubricating air compressor cylinders, appears in a very valuable pamphlet recently issued by the Fidelity and Casualty Company, of New York. It should prove of interest, as it points out the safe and unsafe procedures:—Recent disastrous explosions in air-compressor systems present striking examples of the danger existing from the use of ordinary engine oil in the air cylinders of air compressors. Only a pure mineral oil, with a flash point as high as good lubricating qualities will permit, should be used. As little as possible of even the best oil should be used. An excessive amount of oil should be kept out of the system. Numerous cylinder oils are compounded, and such oils are likely to produce a carbon that will stick the valves, and collect on the valve faces, and other parts of the cylinder and valve chambers, resulting in a danger condition. Air receivers are liable to explosion from accumulated oil deposits. Every receiver should be equipped with a pressure gauge, a safety valve, and proper drains, and all reservoirs and likely places of deposit in the air line should be thoroughly and frequently drained and cleaned. It is bad practice to have the inlet of an air compressor taken from a hot or dusty room—the air should be cool and as clean as possible. The practice of throwing kerosene oil into the inlet of an air compressor to clean it is an extremely dangerous one, and the cause of an explosion under such circumstances is not difficult to understand. Lubrication of the air cylinder with soapsuds (preferably made of soft soap, about 1 part to 15 parts water) for a few hours each week (or less frequently if the load is light), instead of oil, will help very materially in keeping the cylinder clean. The only danger from the use of soapsuds is rust, and this should be overcome by being careful to discard the soap and feed the cylinder with oil an hour or so before shutting down. The receiver blow-off should then be opened and the accumulation of oil and water drained off. An air-compressor engine should not be controlled by the air pressure alone, as many are, but should be fitted with an auxiliary governor which will act as soon as the speed rises above a certain predetermined limit. This will prevent the engine from "racing," in case an accident to the tanks or piping causes a sudden lowering of the pressure. It is not necessary for an explosion to take place to produce a lowering of the pressure, as the giving way of a pipe, valve, or tank from any cause will have the same effect. The steel used in the construction of air receivers should be of the best quality, and should have a tensile strength of from 55,000 lb. to 62,000 lb. per sq. in. The side seams should be double-riveted, or better still, be butt-strapped. The heads should be dished. The large sizes of receivers should be provided with manholes.

* * * *

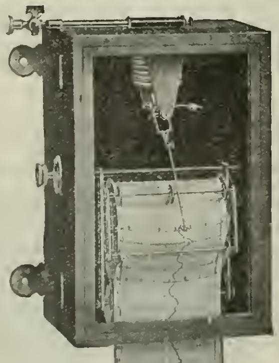
Table Mountain Railway.

Two alternative schemes for the construction of a railway to the summit of Table Mountain have been presented to the Capetown City Council by Mr. H. H. Peters, consulting engineer, of Zurich, and a special joint committee of the Council having provisionally approved of "Scheme 2" at an estimated cost of £75,000, communications have been addressed to the various suburban municipalities on the subject in order that the Council may be enabled to approach the ratepayers for their sanction for the raising of a loan for commencing the work without delay. The Inspector of White Labour in his last report says:—The provisionally approved scheme comprises two funicular railway sections—Rocklands-Platteklip and Platteklip-Central Table, with a change at Rocklands and at the Middle Station, Platteklip, the power to be furnished by the Corporation electrical works. It is estimated that the work of construction will occupy two and a half years, and the consulting engineer considers that the work offers no insurmountable difficulties, although special arrangements will require to be made for the water supply and the transport and housing of workmen. As a very large proportion of the work will require to be carried out by skilled labourers of a particularly intelligent type, it is therefore certain that many opportunities of employment will be available for the able-bodied white labourers of the Peninsula.

* * * *

Underground Ore Crushing.

A rather novel development in mining practice is the employment of crusher stations underground. In the Round Mountain Mining Co.'s mine, at Round Mountain, Nevada, are two crusher stations. During the year 1912-13, the following work was done: No. 1 produced 6,382 tons of $4.69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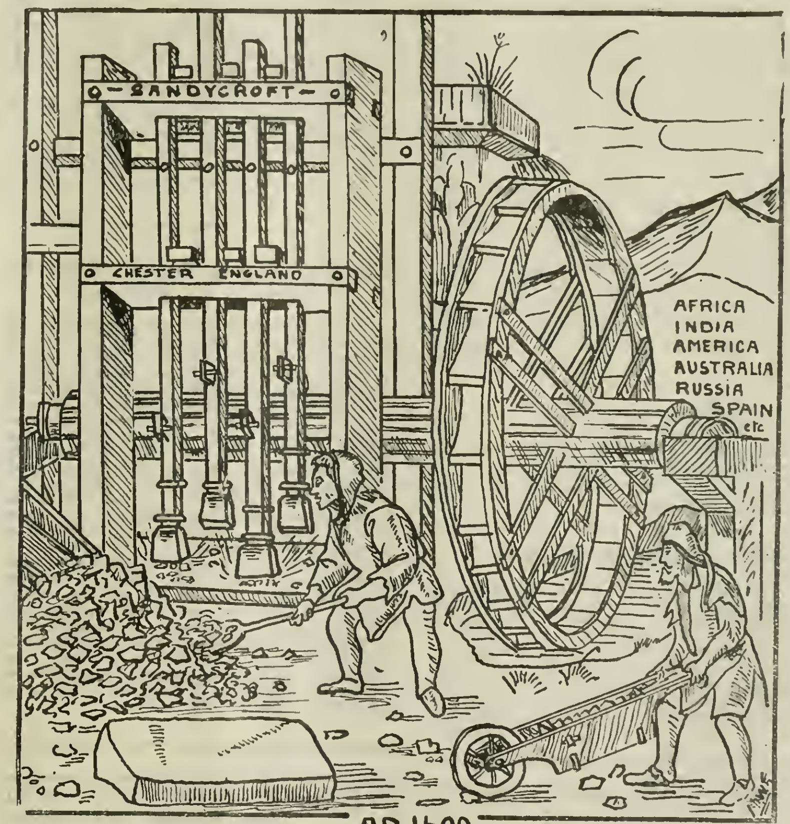

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ore, and 16,306 tons of waste worth 77c. per ton; while No. 2 produced 15,590 tons of $7.12 ore, and 40,589 tons of waste worth 97c. per ton. The cost of crushing, screening, and transport, including repairs, was 5c. to 6c. per ton. It is quite conceivable that under certain circumstances underground crushing would prove a profitable operation. In so far as the Witwatersrand is concerned, however, there is no reason for thinking that the practice will extend here. We should imagine that the running of crushers underground would have a deleterious effect on mine atmosphere, and for this reason, if for no other, it is unlikely that underground crushing will be carried out in the mines of the Main Reef series.

* * * *

Catalogues Received.

Chatteris Engineering Works Co., Chatteris, Cambs.

This firm issues an attractive catalogue devoted specially to the illustration and description of machinery for use in diamond mines. The manufacture of diamond machinery and plant has been for years the principal speciality of this firm. Included in the catalogue are specifications and illustrations of single, double and triple set crushing rolls, elevating and washing plant, washing pans and pulsators. The firm makes a speciality of prospectors' diamond washing pans. These pans have been supplied in large numbers for successfully prospecting diamondiferous deposits in various parts of the world. They give equally good results when prospecting for rubies. The pan and framing is of steel construction and suitable for "man transport." When specified, wood framing is provided and, if preferred, the driving gear can be arranged below the pan. Handles are provided for manual operation. The deposit, which is fed into the pan by hand, is agitated by a flow of water and the rotary movement of steel radial arms and tines. The tailings overflow passes through an opening at the centre of the pan and the diamonds or rubies are withdrawn, through a sliding discharge door in the bottom of the pan, into a suitable deposit chute.

* * * *

Attention is drawn to the new safety plug for air compressors introduced by Messrs. Harvey & Co., Ltd., which can now be obtained from stock. This safety plug fuses and blows at a temperature of 350 deg. Fah. By the use of these safety plugs absolute security is obtained, and reliance solely on thermometer readings is obviated.

* * * *

Safety Rules—Electrical Work.*

(1) Power feeders above 250 volts shall be handled with great care, as carelessness may cause a fatal accident. Such systems should never be worked upon outdoors when live, during rainy or damp weather, and otherwise only with the approval of the electrician.

(2) The 250-volt direct-current power circuit under ordinary conditions is not likely to cause death by shock; but the same precautions should be observed in handling this circuit as in handling those of higher voltage, not only to avoid possible injury from shocks and burns, but to form habits of precaution in handling wires. Remember that it is possible to receive a fatal shock from a 125-volt circuit under certain conditions.

(3) So far as possible, treat all circuits as though they were live, even though you believe them to be dead.

(4) Never handle electric wires while standing or sitting in a wet place, without extra precaution to obtain insulation from the ground.

(5) In handling any circuit known to be live, whenever possible, use only one hand. It is best to keep the other hand behind the back. The most dangerous shocks are those from hand to hand.

(6) When working upon live circuits, take care to work upon one wire at a time and properly insulate yourself from the ground and from other wires of the circuit. Insulate each joint as it is made before starting on another wire. Be sure you are properly protected from falling from a high position in case of shock. Careless haste in working on live circuits is the cause of most accidents. Be cautious and alert at all times and under all conditions.

(7) The insulation on electric wires cannot be depended upon to protect you from shock. Avoid working upon any live circuits as much as possible.

(8) Never close a switch without full knowledge concerning the circuit and why the switch was opened.

(9) When an electrical worker is engaged at pole work or other overhead work, he should wear a belt and safety strap.

(10) Tape the handles of your tools, to assist in preventing short-circuits across them.

(11) If you see any person handling electrical apparatus who has no right to do so, stop him at once and report the matter to his foreman.

(12) If you see any electrical equipment in unsafe condition or improperly operated, correct the conditions or report the matter to the proper foreman.

(13) There are many special conditions which make electrical work dangerous. Even telephone or signal wires may become crossed with high-tension wires and become dangerously charged. It is not possible to explain in detail all such possible cases, but competent workmen are always afraid.

(14) Never look at an intense arc without adequate protection, such as heavy blue or black glasses. Intense pain results from exposure of the delicate nerves of the eyes to the intense light of the electric arc. As this pain does not manifest itself until several hours afterward, you should immediately seek the advice of the doctor, if you have so exposed your eyes, in order to avoid suffering.

(15) When you complete a job, never leave tools or material overhead, and always replace safeguards.

(16) You must have the switch open when working on a lamp.

(17) Do not throw or leaves pieces of carbon where a person is liable to step on them and lose his footing.

(18) Carefully inspect wires, ropes, arms, etc., when trimming lamps and report defective conditions immediately.

* From Inland Steel Co.'s book of rules.

The Purchasing Power of the South African Native.

Mr. Sothern Holland's report on the trade of South Africa contains some suggestive observations as to the value of the native as a purchaser of imported articles. There is no precise way of ascertaining what proportion of these goods is bought by the native and coloured population, but at an estimated figure of 3s. 6d. a head in the Cape Province and 2s. elsewhere, the value comes to £6,351,580. This basis of calculation is conservative, and, in any case, the amount is sure to increase rapidly. Whenever it is open to him to do so, the native is now beginning to do skilled work, and shows himself a competent workman. Every year education and increasing contact with civilisation add strength to this movement, and an enormous new field is opening out for imported articles. Thus the vast numbers of South African natives are acquiring a new economical value. It is true that everything that is possible is done to reserve skilled work for white labour, and the steady advance of the native artisan will be watched with much suspicion and apprehension. But it will be largely realised as the country progresses that the black man's gain is not the white man's loss, and that all work enriches the whole country. The natives in any country cannot be expected to acquire new tastes and wants while he retains primitive habits of life, and the best way of inculcating a proper appreciation of the white man's wares is to make a good workman of him. In no long time at the present rate of progress the buying power of the South African native will become so great as to constitute a new force in both commerce and politics.—*Colonial Office Journal.*

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THE WEEK IN THE SHAREMARKET.

A Time of Suspense—Prices Stagnate—Awaiting News.

Up to the time of going to press no news has be received from Pretoria, and the market remained in the doldrums. The week has been one of painful suspense, and prices have fluctuated very little at the lowest levels. All Rand stocks have borne the strain remarkably well, but the more speculative tin and diamond counters have suffered. It is only reasonable to suppose that those stocks that have slumped most will most readily respond to any improvement, and will most quickly react to something approaching their former levels. A feature of the crisis is the inherent soundness shown by the market. There are no failures or defaulters to report, and the worst of the trouble has been safely negotiated.

	Friday, 18th.	Sat., 19th.	Mon., 21st.	Tues., 22nd.	Wed., 23rd.	Thurs., 24th.
African Farms. ..	13 0B	12 9	13 0	13 0B	13 6B	13 9
Apex Mines ..	18 0B	18 9s	18 0s	18 6s	17 6B	20 0s
Aurora West United	—	9 0s	—	—	—	—
Bantjes Consol. ..	17 6s	16 0B	16 9s	16 0B	16 9s	—
Benoni Consol. ..	—	3 0s	2 6B	2 4B	2 6B	2 9B
Blaauwbosch Diam.	85 0*	85 0†	—	—	—	—
Brakpan Mines ..	56 6B	56 0B	57 0B	56 0B	56 0B	57 0B
Breyten Collieries	27 6B	—	—	—	27 6B	25 0B
British S.A.. ..	—	19 0B	—	19 0B	19 0B	19 0B
Bushveld Tins ..	0 6s	—	0 5B	—	—	0 4B
City & Subs. (£4). ..	40 3B	39 0	39 3	39 6	41 0	40 0B
City Deeps.. ..	51 6	51 6B	51 3B	51 6	52 6	52 6B
Cloverfield Mines ..	—	4 0	3 10B	3 7	3 9B	3 10B
Cons. Langlaagtes	21 0B	24 3	24 6	24 0B	24 6	24 6B
Cons. Main Reefs ..	15 0	14 9	14 6	14 6	14 9	15 0
Cons. Mine Selection	10 0s	—	10 0s	—	—	—
Coronation Freeholds	—	0 4B	0 4B	0 4B	0 4B	0 4B
Crown Diamonds. ..	9 3B	7 6B	7 9	8 0	9 0B	9 9
Crown Mines (Deb.)	—	—	—	—	—	£90B
East Rand Centrals	7 6B	7 6B	7 6B	7 9	7 6B	7 6B
East Rand Coals (2/6).	1 7B	1 8B	1 6B	1 7B	1 7B	1 7B
East Rand Deeps ..	2 6s	—	1 6B	1 9	1 9B	2 6s
East Rand Props.	—	47 6	47 6B	47 0B	46 6B	—
East Rand Debs....	£90s	£89	£90s	£90s	£90s	£90s
Eastern Golds (1/-)	1 3B	1 3	1 2B	1 3	1 3B	1 4B
Frank Smith Diam.	9 6	8 9B	8 6B	8 9	9 6B	9 3
Geduld Props. ..	19 6	19 3B	—	19 3B	—	20 0B
Goldenhuis Deeps	—	25 0B	25 0B	—	—	—
Glencoe (Natal) Colls.	7 0B	7 0B	6 9B	—	6 6B	—
Glynn's Lydenburgs	15 0B	15 0B	—	17 0s	—	15 6B
Government Areas	19 3	18 9	18 6	18 9	19 6	19 6B
Jumpers	5 0s	—	5 0s	5 0s	3 0B	—
Jupiters	—	—	6 0B	6 0B	6 3B	6 0B
Kaalfontein D. (2/6)	0 5s	0 5s	—	—	0 3B	0 3B
Klerksdorp Props..	2 0B	2 0B	2 0B	2 1B	2 3B	2 3
Knight Centrals. ..	8 0B	8 0	8 0B	8 3	8 3B	8 6
Lace Props. ..	3 0s	2 6	2 4B	2 1B	2 3B	2 9
Lydenburg Gold Fms.	2 9B	2 9B	2 6B	2 6B	3 0s	2 9B
Main Reef Wests ..	8 0B	7 6B	8 0	8 0B	8 0B	8 0B
Main Reef W. Debs..	—	—	—	—	£60B	£57
Meyer & Charltons	—	—	—	—	100 0s	—
Middlevlei Estates	1 0B	—	0 9B	—	0 10B	1 0B
Modder B's.. ..	68 6B	—	71 0s	69 0B	69 0B	70 0B
Modder Deeps ..	28 6	28 0	27 0B	27 3B	27 6B	27 6B
Natal Navigation Col.	—	14 0B	—	—	—	—
New Eland Diam...	—	—	—	27 0s	—	—
New Era Cons. (5/-)	5 9B	5 0B	5 9B	5 9B	6 3B	6 0B
New Geduld Deeps	2 0B	2 0B	2 0B	2 0B	2 1B	—
New Kleinfonteins	17 0B	16 0B	16 0	15 6B	17 6	17 3B
New Modders ..	215 0B	212 6B	210 0B	210 0s	217 6B	210 0B
New Rietfonteins ..	4 6B	4 0	—	—	—	—
New Unifieds ..	—	15 6s	—	15 0s	—	—
O.F.S. & Trans. D.	1 9s	1 9s	1 6	1 3B	1 4B	—
Premier Pref. (5/-)..	—	—	—	—	—	165 0B
Pretoria Cement Co.	49 0s	47 6	47 0B	—	48 6s	—
Princess	—	—	—	5 0s	—	4 0B
Rand Klips ..	1 0B	1 0B	1 0B	1 3	1 1B	1 3B
Rand Nucleus ..	1 9B	1 9	1 8B	1 9	1 10B	2 0B
Randfontein Deeps	—	—	—	—	3 0s	
Randfontein Estates.	24 9	25 0	24 6B	24 3	24 6B	24 9B
Roberts Victors ..	—	—	—	35 0s	35 0s	
Rooiberg Minerals.	26 9B	26 9B	26 6B	27 3	28 0B	28 3
Rood. Durban Deeps	—	—	—	18 9B	—	—
Roodepoort U.M.R.	—	—	6 9s	6 9s		
Shebas	1 10s	1 6B	1 10s	1 9	1 9B	1 9B
Simmer Deeps ..	—	—	—	—	2 6s	—
S.A. Breweries ..	37 0B	37 0B	37 0B	38 0B	38 0B	—
S.A. Lands ..	3 0B	3 1B	3 1	3 0	3 1B	3 4B
Springs Mines ..	14 3	13 9B	13 6B	14 0B	14 0	14 9
Sub Nigels	8 3	—	8 9	8 6B	9 6B	10 6
Swaziland Tins ..	37 6B	37 6B	37 6B	—	38 6B	—
Trans. Coal Trusts	34 6	33 6B	34 6B	35 0	35 0B	35 6
Trans. G.M. Est....	50 0B	49 0B	48 0B	49 0	48 3B	50 9B
Van Ryn Deeps ..	27 3	27 6	27 0	27 0	28 0	28 3
Village Deeps ..	37 0B	39 0s	36 6	38 0s	37 0B	—
West Rand Cons. .	—	8 0	8 0B	8 6	8 9B	—
West Rand Estates	3 0B	3 3B	—	3 0B	—	—
Witbank Collieries		40 0B	40 0B	40 0B	42 0B	42 0B
Witwatersrands ..	—	60 0	59 0B	61 0	60 0	60 0B
Wit Deeps ..	49 0	50 0B	49 0B	49 0B	51 3	50 6B
Wolhuters	12 9	12 0	11 9B	12 6	12 6B	13 0B
Zaaiplaats Tins ..	32 0	32 3B	32 0	31 6	32 0B	33 3

B Buyers. s Sellers. * 10 Shares. † 40 Shares.

City and Suburban.

The report on operations at the City and Suburban mine for the quarter ended the 30th June, states that from 80,340 tons milled the total yield is 36,230·975 ozs. of gold, the revenue from which is £152,332, including £775 underestimated for the previous quarter. Working expenditure absorbed £86,461, or 21s. 6·287d., which left a working profit of £65,870, or 16s. 1·775d. per ton. The capital expenditure for the period amounted to £3,202. On development work, the number of feet driven, sunk and risen, exclusive of stopes, is 1,063 ft. The reef disclosures were as follows:—Main Reef exposed, 700 ft.; width, 20·6 ins.; assay value, 13·3 dwts. Main Reef Leader exposed, 1,907 ft.; width, 20·1 ins.; assay value, 23·3 dwts. South Reef exposed, 1,015 ft.; width, 19·8 ins.; assay value, 9·7 dwts. Total exposed, 3,622 ft.; width, 20·1 ins.; assay value, 17·5 ins. The tonnage stoped, including ore obtained from developing faces was 88,379 tons.

New Heriot G.M. Co.

The report on working operations at the New Heriot for the three months ended the 30th June, shows that on development work, 1,023 ft. were driven, risen, sunk, etc. The mill crushed 38,100 tons, the revenue from gold won being £66,060, including £1,345 from treatment of accumulated slimes. Working expenses absorbed £39,451, or 20s. 8·508d. per ton, which left a working profit of £26,610, or 13s. 11·621d. per ton. The value of recovery from accumulated slimes was 8·47d. per ton.

The Mining Institute has moved into more commodious premises at St. James' Mansions, which will in future be Professor Yates' address.

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Dominions Trade Commission. It was notified in the "Union Gazette" of 1st July that the Commission appointed by His Majesty the King to inquire into and report upon the natural resources of the Dominion of Canada, the Commonwealth of Australia, the Dominion of New Zealand, the Union of South Africa, and the Colony of Newfoundland; and, further, to report upon the development of such resources, whether attained or attainable upon the facilities which exist or may be created for the production, manufacture and distribution of all articles of commerce in those parts of the Empire; upon the requirements of each such part and of the United Kingdom in the matter of food and raw materials, and the available sources of such; upon the trade of each such part of the Empire with the other parts, with the United Kingdom, and with the rest of the world; upon the extent, if any, to which the mutual trade of the several parts of the Empire has been or is being affected beneficially or otherwise by the laws now in force, other than fiscal laws; and, generally, to suggest any methods, consistent always with the existing fiscal policy of each part of the Empire, by which the trade of each part with the others and with the United Kingdom may be improved and extended, is due to visit the Union of South Africa in December next for the purpose of taking evidence. The itinerary of the Commission will be published at a later date, and particulars will, at the same time, be given respecting the places where and the dates on which evidence will be heard. In order to prepare the way for the Commission's labours, the Union Government has appointed Mr. Frank Robb, Acting Divisional Superintendent, South African Railways, who will be styled "The South African Officer, Dominions Royal Commission," and whose address is Railway Offices, Port Elizabeth, to take charge of the local work of the Commission. All local arrangements for the conduct of the Commission's inquiry in South Africa are in Mr. Robb's hands, and application should be made to him for such information as may be required respecting the subjects that will come under review by the Commission, or any other matters connected with the Commission's visit. The success of the Commission's visit will depend very greatly upon the effective cooperation of all representative bodies in South Africa constituted for the stimulation or protection of trade, commerce, or industry. It is, therefore, requested that any applications which may be made to such bodies by Mr. Robb for information or advice may be accorded favourable consideration.

The New Mail Day. In connection with the alteration of the sailing day of mail steamers from Capetown homewards from Wednesday to Saturday, Reuter's Agency learns that the Kildonan Castle, which inaugurates the new service, will sail from Capetown on Saturday, September 6, arriving at Southampton early on Tuesday, the 23rd, and making the interval on that occasion ten days between the arrivals in England of the South African mails. Thereafter the mail steamers will arrive regularly at Southampton on Tuesday morning, and continue to sail from Southampton on Saturday afternoon. In consequence of the change, the approximate movements of the mail steamers on the South African coast have been revised as follows:—Capetown: Arrive Tuesday morning, leave Wednesday morning. Algoa Bay: Arrive Thursday morning, leave Friday evening. East London: Arrive Saturday morning, leave Saturday evening. Natal: Arrive Sunday, interval of six days at Natal, and leave Saturday afternoon. East London: Arrive and leave Sunday. Algoa Bay: Arrive Monday morning, leave Tuesday evening. Mossel Bay: Arrive and leave Wednesday. Capetown: Arrive Thursday, leave 1 p.m. on Saturday for Southampton via Madeira.

* * * *

Canada and South Africa. It becomes more and more apparent that other countries are turning their attention to South Africa as an outlet for merchandise produced or manufactured under a protective tariff. Canada is the latest example, and Mr. W. J. Egan has been appointed by the Canadian Government as Trades Commissioner in South Africa. During the course of an interview Mr. Egan stated that the volume of trade between Canada and South Africa was on the increase. The total value of the goods shipped from Canada to South Africa during 1912 was 2,560,000 dollars; whilst the shipments of automobiles had increased to 136,000 dollars. Mr. Egan, who has been studying the matter for some considerable time, feels sure that there is a big market in South Africa for Canadian goods. Such articles as automobiles, farm machinery, clothing, hosiery, underclothing, and dry goods of Canadian make find a ready market in South Africa. Mr. Egan will endeavour to keep the Canadian manufacturer in touch with the consumer, so that Canada will reap the benefit which has, in a great measure, been going to the middleman in England. In order to find out just where the demand is greatest, Mr. Egan will arrange for trade correspondents in all parts of his territory, and these will keep him posted on the conditions.

CONTINENTAL

TYRES.

Reduction in Price,

But no Reduction in Quality.

Ask your Garage for New Price List.

Automobile Notes.

Mr. James Owen, who writes on motors and motoring in the *Westminster Gazette*, says some figures that have lately been issued strikingly demonstrate the wonderful trade that is being done in motor-cars and allied productions in Great Britain. There is unfortunately no information available as to the aggregate output of the British factories, but some idea of the large and growing trade that is being done may be gathered from the fact that during last year the exports of motor-cars, chassis and motor parts from the United Kingdom totalled £3,681,824, an increase of roundly half a million sterling over 1911. Yet, notwithstanding the increase in the domestic production and the establishment of an export trade, England continues to be by far the most important market in the world for the automobile productions of foreign countries, imports of such goods being, in fact, nearly ten times as great as those of any other country, last year's total being no less than £7,145,927, as against £5,995,236 in 1911. The current year, so far as it has gone, shows that all sections of the trade—both imports and exports—continue to move steadily upwards. For the four months ending with April last the imports—which comprise complete cars, chassis, motor parts, and tyres—totalled £2,573,850, as compared with £2,419,547 in the same period a year ago. Included in the sum mentioned are no less than 2,419 complete vehicles and 2,915 chassis. Since the beginning of 1913 motor tyres have been given a separate classification in the official returns.

* * * *

It is interesting to learn that the Society of Motor Manufacturers and Traders has formed a new section dealing with oil engines, known as the oil engine section. Many of the important firms manufacturing marine and stationary internal combustion engines, for a great variety of purposes, may have regarded the sphere of influence of the society to be confined to motor-cars and their accessories solely, for up to the present time few engine manufacturers have been represented on the committee of the accessories and component section, and no steps have been taken to cater for the large number of important firms engaged in the manufacture of marine and stationary internal combustion engines other than those closely allied to automobilism. The formation of the new section known as the oil engine section must, therefore, be interesting reading to those manufacturers, for the society propose to cater for the business side of those firms whose interests are bound up in the oil engine section in the same manner as it has catered for the business side of the motor-car industry, an instance of which will be revealed at the forthcoming Marine and Stationary Internal Combustion Exhibition, to be held at the Agricultural Hall in November by the Society of Motor Manufacturers and Traders.

The accounts of Bechuanaland Exploration Company for 1912 show that the shares and interests realised during the year resulted in a profit of £3,125, and £20,141 8s. 1d. has been received in dividends. After providing a sum of £16,2[illegible]3 for development and depreciation account, the net profit amounted to £7,616, which, added to the amount brought forward from the previous year, makes a total of £8,515 to credit. The directors recommend the payment of a dividend of 1 per cent. for the year.

* * * *

The Chartered Company's "deal" in 1,200,000 acres with the Liebig Extract of Meat Company is a sale outright—the purchase price being 1s. per acre. There is, in addition, an annual rental, but this is a small matter. The object of this arrangement is to induce those in charge of industries to establish themselves in Rhodesia. The Liebig Company is under an obligation to stock the land it has acquired with cattle.

* * * *

At the general meeting of the Maritzburg Automobile Club, the Chairman, Dr. Oddin Taylor, said that in co-operation with the Natal Automobile Club and the Natal Tourist Association, they were making representations to the Provincial Council for the adequate sign-posting of the roads throughout the Province.

The best "Reef Traveller" is the *South African Mining Journal.*

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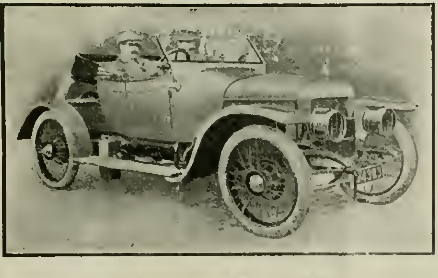

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QUARTERLY REPORTS.

Brakpan Mines.

The report on operations at Brakpan Mines for the quarter ended the 30th of June states that from 163,309 tons milled 55,002 ozs. of gold were obtained, the revenue from which was £231,524, or 28s. 4.249d. per ton. Working expenses absorbed £153,262, or 18s. 9.234d. per ton, which left a working profit for the period of £78,262, or 9s. 7.015d. per ton. The linear development for the quarter amounted to 5,530 feet, of which 1,365 feet were on reef averaging 5.7 dwts. over a reef width of 35.4 inches. Of the sampled footage, 1,911 feet were in payable areas, and averaged 10 dwts. over 32 inches. Both the west incline haulage and the main incline south have recently entered payable areas. After providing for capital expenditure, excess development, profits tax and dividend No. 3, the unappropriated profit at the 30th of June stood at £61,383, being an increase of £10,293 on the figure at the 31st of December, 1912. The capital expenditure incurred during the quarter amounted to £663 1s. 1d. The company's employes, with the exception of the staff and engine-drivers, struck work on the 30th of June in sympathy with the men who were out at the New Kleinfontein mine. A settlement was effected on the 5th of July, but it was not until the 8th that a start could be made towards the resumption of work. Pumping had not been interfered with, and there was no damage to property. There was, however, great disorganisation, which will require some time for correction, and there was a considerable loss of native labour through time-expired boys refusing to renew. Work, therefore, had to be restarted on a curtailed basis, and for this reason, as well as because of working cost having to be debited with heavy extraordinary charges arising out of the strike, only a small profit is anticipated for July. The prohibition as to native recruiting imposed by Government during the strike is still in force, and is exerting an unfavourable influence on the labour supply. Furthermore, the tendency for the time-expired boys not to renew continues. The restriction of operations for some time to come is therefore in prospect, though to what extent and for what period is yet a matter of uncertainty.

Springs Mines.

The North shaft was sunk a further 103 feet to provide the necessary sump, making the total completed depth 3,557 feet. Considerable work was done in connection with the station at the reef horizon and a start made on development, the following summary showing the position at the end of the quarter :—

	Total ft.	Footage. smpd.	Reef width ins.	Assay value dwts.
North haulage	34	30	30.08	19.60
East haulage	178½	140	34.32	10.71
West haulage	138	110	36.04	15.13
Main incline	105	50	32.90	16.31
Station and station roadways	575½	115	38.09	7.42
Totals and averages	1,031	445	35.27	12.00

The south shaft has been sunk an additional 387 feet and timbered 398 feet, making the total depth at the end of the quarter 3,521 feet, of which 3,494 feet are timbered. It is expected that the reef will be reached in August, a borehole, to which reference was made at the annual general meeting, having intersected it at a depth of 3,696 feet. The core from this borehole assayed 11.5 dwts. over 38.5 inches. The Minister of Mines has intimated that the application for Discoverer's Rights has been granted. This will increase the company's area by 171.6 claims, which, added to the 1,160 claims to which it will be entitled on proclamation of the farm, will make the total area 1,331.6 claims. The Rand Water Board took 113,848,000 gallons of water during the quarter. During the quarter the financial position of the company has been greatly strengthened by the debenture issue of which you are aware and which was referred to at the annual general meeting held on the 27th May last. Operations were interrupted from the 2nd to the 8th July, owing to certain of the employees at the mine having joined in the general strike, called in sympathy with the men on strike at the New Kleinfontein. Pumping was not interfered with, and no damage to property was sustained. Work is now proceeding normally.

INVESTORS' DIARY.

The following company meetings have been announced:—

July 30.—Booysens Estate.
July 30.—Middlevlei Estate.
July 31.—Glynn's Lydenburg (Special).
Aug. 5.—City Deep.
Aug. 26.—Glynn's Lydenburg (Special).
Aug. 26.—Transvaal Gold Mining Estates (special).
Sept. 19.—Transvaal Gold Mining Estates (special).
Sept. 19.—Transvaal Gold Mining Estates.
Sept. 26.—Simmer and Jack Prop.
Sept. 26.—Sub-Nigel.

New Patents.

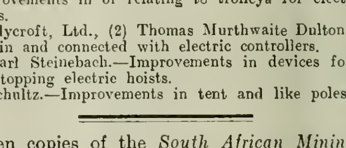
310. Wm. Fennell.—Improvements in or in connection with tube mills.
311. Thomas Unsworth.—An improved pneumatic wheel.
312. Carl Dresdner.—The advertising clock.
313. Charles Wm. Twiss.—Improved process for cleaning diamondiferous soils and gravels.
314. Albert Carmel.—An improved specific remedy for the cure of piles.
315. Albert Carmel.—An improved specific remedy for hysteria, convulsions, worms and insomnia.
316. Samuel Redfern.—Improvement in or relating to packing for steam engines and the like.
317. John William Cobb.—A process for the extraction of ammonia and sulphur compound from gas.
318. Ray C. Newhouse.—Improvements in roller crushers.
319. Johannes Frederick Janse van Rensburg.—Improved separating apparatus with pulsating reservoir.
320. John Roger Walters.—Steel rope slip roller.
321. Erik Gustaf Hedman.—Improvements in knife edge bearings for weighing apparatus.
322. F. W. Oppermeier and J. A. J. Stuy.—Improved nut with spring washer.
323. Thomas S. McLaren.—Electro-thermo hot air incubator.
324. (1) John Bartle, (2) Thomas Barrett.—Open window safety catch.
325. Arthur Douglas Allan.—An improvement in the construction of cigarette pockets and the like.
326. (1) Francis Edward Matthews, (2) Henry James Wheeler Bliss, (3) Harry Montagu Elder.—Improvements in the manufacture of unsaturated hydro-carbons.
327. Alfred Wm. Torkington.—Improvement in or relating to tyres and in the manufacture of the same.
328. Victor John Engert.—Improvements in floor coverings.
329. (1) George Alfred James, (2) Electric Amalgamator Company.—Method and apparatus for recovering metals.
330. (1) Frederic Lewis Nathan, (2) Wm. Rintoul, (3) Frank Baker.—Improvements relating to explosives.
331. John Pountney Udal.—Improvements in the manufacture of nitro-glycerine.
332. Elberton Douglas Smith.—Machine for packing cigarettes.
333. Ernest Kilburn Scott.—An improved furnace for the fixation of nitrogen.
334. (1) Edward May Munro, (2) The R.E.T. Construction Co., Ltd.—Improvements in or relating to trolleys for electric traction systems.
335. (1) Sandycroft, Ltd., (2) Thomas Murthwaite Dulton.—Improvements in and connected with electric controllers.
336. Josef Carl Steinebach.—Improvements in devices for automatically stopping electric hoists.
337. Fritz Schultz.—Improvements in tent and like poles.

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's Theatre: John Tiller Company ...	8.15
Standard:	See bills.
Empire	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9



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Notes and News.

Position at Messina.

At Messina smelting operations are commencing, but operations have been somewhat disorganised through non-delivery of fuel as a consequence of the industrial rupture. The Messina management, in view of the situation, have been drawing a little coal from the company's own colliery in the Northern Transvaal. On account of the near approach of the railway and the fact that the coal of the company's own colliery has not yet been proved satisfactory for smelting purposes, water was allowed to accumulate in the colliery and such coal as has been drawn from the property has been taken from the surface dump.

* * * *

Otavi Mines.

The report of the Otavi Mines and Railway Company for the year ended March 31 last states that the gross profit amounted to 5,525,160 marks, as against 3,962,978 marks last year. The net profit, after writing 1,289,237 marks off mining works and appropriating 415,612 marks to renewals and constructions and 150,000 marks to reserves, amounts to 3,370,310 marks. A dividend is recommended of 8 marks per ordinary share and 7 marks per genuesschein (against 6 and 5 marks respectively in the preceding year). Development work on the 5th level during the year has been satisfactory and shows a considerable increase in the ore reserves.

* * * *

Breyten Collieries.

In these times of industrial dislocation it is refreshing to hear of a concern which is showing signs of advance and progress. Some months ago we published a full and detailed account of the Breyten Collieries property in the Eastern Transvaal, and then stated that an expansion of productive operations was contemplated. Recently the equipment of these mines has been added to and last month an output of approximately 40,000 tons was obtained. Although rather outside the zone of strike activities, the collieries felt the pinch of disorganisation to some extent, and were it not for this the output would doubtless have been substantially larger.

* * * *

Reef Struck in the Sub Nigel.

The reef in " E " shaft was intersected on July 24, at a distance of 1,745 feet on the incline, or a vertical depth of 1,251 feet below the collar of the shaft. Ten samples taken around the periphery of the shaft, at the point of intersection, showed an average value of 1·8 dwts. over an average width of 6 inches of mixed reef, slate, and quartz. The reef so far encountered is not continuous, small faults being met with. It is very pyritic, consisting of small pebbles with yellow slate underlying, and in some places yellow slate and quartz, although at the point where No. 10 sample was taken, large scattered pebbles were found along the footwall. Development will be advanced without delay, provided sufficient native labour is available.

* * * *

Cinderella Consolidated.

A circular has been issued to shareholders by the London secretary summarising the conclusions arrived at by the company's engineer, as the result of the examination which the board had instructed him to undertake. Dealing with the question of grade, he reports that the falling off which has been experienced during the past few months is due to the paucity of stope faces of average value. Referring to the question of working costs, to the gradual increase of which may be attributed the declining profits and more recent monthly losses, he confirms the statements of the chairman in his speech at the annual general meeting in explanation of the causes. Owing to the impossibility of bringing about any material improvement under either of these heads in the immediate future, and while crushing under the present difficult conditions is being concurrently carried on, the engineer recommends the temporary suspension of milling in order to enable development work to be carried on unhampered. Milling operations have consequently been suspended as from June 25.

Results of a Minimum.

In the latest issue of the series of "Statistical Monographs" for exposing Socialist and Social-Radical fallacies published by the Liberty and Property Defence League, the results are given of a minimum wage, according to the latest proposals, as applied to five great industries. Two specific demands for a minimum wage have been formulated during the present year, one for 35s. per week for all male employees and 25s. for women, the minimum for youths to average 22s. and for girls 18s.; the other for a minimum of 30s. per week for all adult employees in urban districts, men and women alike. Taking five great trades, viz., boots and shoes; shirts, millinery, etc.; cotton; iron and steel; and engineering; it is shown that the minimum wage would wipe four of these trades out of existence, since the total wages bill would in each case exceed the net selling value of the goods produced, and in the case of the fifth (engineering) nothing would be left but a precarious balance, amounting to hardly more than ½ per cent. of the capital employed in its undertakings to stand between its continuance and bankruptcy.

* * * *

Gold Fields Rhodesian Development.

The report of the Gold Fields Rhodesian Development Company, Limited, for the 14 months ended March 31, 1913, shows a credit to profit and loss of £67,199, after deduction of all expenses. The state of the market has not permitted of profitable operations, and the above amount, which is mainly derived from dividends on the company's investments, the directors propose to carry forward to the current year. Owing to the complete inactivity of the share market, it has not been possible to effect sales of shares either for financing the sub-companies or for the realisation of profits, and, consequently, the company has been called upon to protect the interests of the sub-companies by subscribing to a debenture issue in the case of the Falcon Mines, Limited, and by undertaking to grant temporary loans in other cases. Owing mainly to the unavoidable delays in delivery of railway material and mining machinery caused by the strikes in England, those companies which it was hoped would reach the producing stage in the early part of this year cannot be crushing until towards the end of the year, while others will not arrive at that stage until a few months later. Reports show that two companies, namely, the Antelope Gold Mine (Rhodesia), Limited, and the Bell Reef Development Company, Limited, will be brought to the crushing stage this year.

* * * *

Lloyd's Rand Strike Profits.

Underwriters are not much given to discussing their business, but it is generally believed, says the *Financial Times*, that at Lloyd's the policies issued last week against loss arising out of the Rand miners' strike represent a net profit to the underwriting interests of about £55,000, this figure being arrived at after making liberal allowance for minor claims. The position which arises in connection with this matter is a curious and interesting one; that is to say, while the new policies seem likely to run off almost free of loss, some of the regular policies taken out annually on Rand property have been productive of substantial claims, the buildings which were destroyed during the recent tumult having been such as were regularly covered against fire risks. By way of compensation, there must be set the fact that many more policies are likely to be taken out in future against fire damage and "civil commotions" in the Transvaal than has hitherto been the case, and the volume of this business is likely to be such as to add permanently and substantially to the revenue of the fire insurance companies and those underwriters who specialise in this class of risk.

* * * *

The Cam & Motor Company's Plant.

Excellent progress is being made at the Cam and Motor mine, Mashonaland, in connection with erection of the new plant. The position a week or two ago was that two small rock breakers were in position, the steel frame for the quartz conveyor erected, and all brick and iron work for the drying plant completed. The tip tray discharge was finished, as was the Ball mill plant push conveyor trough. The brick work for the main wall of the six roasting furnaces was finished and erection of the "fines" ore bin in an advanced state. The roasting furnace chimney had been erected and foundations completed for two leaching plant vats. Steel work for the precipitation, clean-up and filter house was erected and work on the erection of the filter vats in a forward state. Four Babcock boilers had been installed and a cooling tower erected. Foundations for the power plant were well forward and foundations for the electric winding engine completed. Excellent progress is being made all round in fact, and considering the very strong development position the outlook for this concern is certainly a good one.

* * * *

A Criticism of Rand Metallurgy.

Mr. H. N. Spicer, an American metallurgist, who visited Johannesburg some little while ago, reviews Witwatersrand metallurgical practice in the current issue of *Metallurgical and Chemical Engineering*. He deals specifically with the evolution of methods of handling slime along the Main Reef series, and like many other overseas critics, whilst paying a tribute to the grandeur of the scale upon which crushing operations are carried out he thinks that "methods" have scarcely been as creditable as statistics. He says: "For many years during the early history of the Rand, the development of the cyanide process was largely in the hands of local metallurgists, and was affected but little by the practice in other countries. And while it is true that the metallurgy of gold ores has been conducted there on a scale not equalled in magnitude elsewhere, nevertheless it has not kept pace, on the whole, in the adoption of methods and machines that are in daily use in other countries, and this is particularly true with respect to the handling and the treatment of slime. During the last year or two some very marked changes have taken place in Rand metallurgical practice, and there is little doubt that more modern methods will be adopted in the mills built in the future. The successful features of cyanidation as practised in other countries are gradually finding acceptance, and will replace the less efficient local methods." We have discussed views such as Mr. Spicer presents in previous issues of this journal. We may be biassed, but we certainly think that on the whole the Rand's metallurgical methods of to-day compare most favourably with those of other mining fields.

* * * *

The "Amalgamated Props" Tangle.

The affairs of the Amalgamated Properties of Rhodesia, Ltd., are rather too complicated for the ordinary shareholder to follow, and the holding of a meeting in London during mail week, which representatives of the Press were not allowed to attend, has further darkened the cloud of nervous ignorance and distrust that obscures the affairs of this company. In the absence of ordinary newspaper reports one has to rely on the accounts of City men who were present at the meeting. The most reliable statement has it that shareholders having 2,000 shares and upwards were invited to attend in order to formulate a scheme for the reorganisation of the capital, with a view to submitting such scheme to the general body of shareholders at a subsequent meeting. Mr. G. R. Bonnard, the chairman of the company, presided, and there were altogether about 70 people present. It appears that the Press representatives were kept out of the room because the chairman, or the directors as a whole, did not think it would be beneficial to the small shareholders to have the proceedings reported in the papers before they had been consulted in regard to the position. It further seems that the chairman put the blame for the position of the company upon Sir Abe Bailey, who was asserted to have repudiated two deals in the shares of the Transvaal and Rhodesian Estates, another concern generally regarded as being a member of the Abe Bailey group, representing a total amount of £50,000, and to have withdrawn his guarantee in respect of £100,000, under cover of which the company had overdrawn at the bank to the extent of £72,000. Sir Abe Bailey (so it is reported) said he had only guaranteed the overdraft at the bank, and had withdrawn that guarantee because he was not satisfied with certain transactions carried through by the directors of the "Amal. Props." As to the two deals mentioned he said they were not done with the "Amal. Props.," but with someone else. The proceedings became stormy, but in the result a resolution was passed, with only three dissentients, proposing the formation of a new company with a capital of £800,000 in 4s. shares, the idea being to offer shareholders one new 4s. share, carrying a liability of 1s. per share, for each 5s. share at present held.

* * * *

A Permanent Home for the I.M.M.

The members of the Institution of Mining and Metallurgy are moving in ambitious directions at present. Since the issue of the twenty-first anniversary circular in April, two events of great importance to the Institution have occurred. The first is the gift of £10,000 in memory of the late Sir Julius Wernher. In accordance with Lady Wernher's wish, this sum has now been invested in trustee securities to form a permanent fund, the income from which will be available for the ordinary purposes of the Institution. The second event is the purchase of a freehold property at the corner of Finsbury Circus and West Street, and within a few yards of Salisbury House. An opportunity of acquiring the property on favourable terms presented itself, and it was realised that the chance of securing an equally desirable site for a permanent home for the Institution, on such terms, was unlikely to recur. After full consideration, therefore, the Council unanimously decided to purchase the freehold for £9,500, and it is expected that the conveyance will be completed within the next week or so. The available funds of the Institution, including the amount already subscribed to the twenty-first anniversary fund, will be used in part payment of the purchase price, the balance being provided by a temporary overdraft, which has been arranged with the Institution's bankers. In addition to the purchase price, it is estimated that about £1,500 will have to be expended upon alterations and the re-decoration of the House. It need hardly be pointed out that the possession of a freehold house in so prominent a position in the City of London, as affording evidence of stability and permanence, should materially strengthen the claims of the Institution in its petition for the grant of a Royal Charter of Incorporation.

* * * *

The Alleged Glut of Gold.

An article on "The Decreasing Value of Money," by Mr. Walter F. Ford, in the *Fortnightly Review* for July, just to hand, will be read with interest in view of the possible limitation of the gold output from the Rand, owing to the present Labour unrest. Mr. Ford declares that the world has been suffering from a superfluity of gold, that this has resulted in a most undesirable appreciation in prices, and that "there is no doubt that much of the industrial unrest which has troubled, and is still troubling, Great Britain, Germany, and other mercantile nations is attributable to the fact that the loss to workmen due to decreased purchasing power of their money wages has not always been covered by increased pay." He holds, further, writing some weeks ago, that "the ouptut of the mines is increasing faster than ever, and there now appears to be nothing to prevent a glut of gold. This will infallibly cause prices to continue to appreciate. If the quantity of gold placed on the market goes on increasing, year by year, the reduction of the purchasing power of the sovereign must necessarily be automatic. If the movement were to continue unchecked, its effect would be nothing less than the gradual crumbling away of all our economic standards, just as they crumbled away in the sixteenth century, when a series of discoveries of rich silver mines cheapened money and caused general prices to rise to undreamed of heights." Mr. Ford's views, it may be noted, are diametrically opposed to those of many other leading economists.

TOPICS OF THE WEEK.

THE RETURN OF REASON.

NOT a moment too soon to vindicate their own sanity, the Railwaymen's and Trades Unions' delegates passed a resolution on Thursday night which, though unfortunately worded, is clearly meant to declare that the idea of a general strike is "off." Any other decision would, of course, have been suicidal, and we are not disposed to quarrel with the wording of the resolution—as other critics have—on the grounds that it merely declares against a strike "at the present juncture." The delegates of to-day may claim that they cannot control future actions of the Federation; and it remains to be seen whether the Government and the mining companies will be content to accept this explanation and—in the case of the latter, especially—abandon all precautionary measures in regard to the natives in the absence of any definite agreement with the Unions. It would seem, however, that the wiser course lies in waiving any such guarantees, since in practice it has been found that the Unions elsewhere do not regard them as binding, and do, in fact, ignore them at their own sweet will. The better course seems to lie in trusting to the good sense and enlightened self-interest of the majority of the men. The lessons of the past few weeks are not likely soon to be forgotten by anybody—by the men themselves least of all. They have had time to ponder and realize the folly of the new-fangled doctrine of the general strike, however "scientifically conducted." "Time," in Lord Milner's famous phrase, "is with us" on the side of peace and commonsense, and every day that passes brings more clearly home to the men the terrors of the chasm over which they hung. In this work of educating the workers up to a proper appreciation of all the facts—economic and otherwise—and away from cheap sophistries of the muddle-headed reformer-at-any-price, the Press can now do a useful work. In the recent hurried and heated times on the Rand it was patent how much of the trouble was due to a failure on the part of many, both in and out of the ranks of the workers, to grasp the elementary economics of the industrial position. In that heat and hurry it was too late to start elucidating the facts. Now, however, the position is different, and during the quiet times ahead nothing should be left undone to explain to the men the delicate position of the mining industry, and how its existence is menaced by such hasty and thoughtless actions as those of last month on the Rand. The truth, like time, is on the side of peace, and to our mind the surest guarantee of permanent industrial settlement on these fields lies in the gradual percolation of the real facts of the situation through all strata of the people.

THE CLOSING DOWN DANGER.

MANY wordy appeals to the commonsense and wisdom of the men concerned in the recent strike have appeared in the papers during the past few weeks, with what, if any, effect it is hard to say. To our way of thinking nothing more effective and opportune than the statistics given by Mr. Clem D. Webb in the daily Press on Thursday has yet appeared. The people who would ignore those plain, eloquent figures would ignore anything. *Inter alia*, Mr. Webb shows that for the year 1912 the value of the mineral output of the Union was £52,711,761. During the same year £18,923,765 were expended in wages by mines and allied concerns within the Union. In 1912 a sum of £12,660.047 was expended by the mining industry of the Union on machinery and stores. In the Transvaal only 1 per cent. of the outlay under this head was for direct importations from Oversea by the mines. What the stoppage, wholly or in part, of the expenditure in the country of this enormous sum of upwards of thirty-one millions sterling means to every trade, industry and profession, needs no emphasis. For ninety per cent. of the people—all but the very richest—it means ruin, misery and starvation. In case all the labour demands were granted, it is conservatively estimated that there would be an increase of 2s. 6d. per ton in the average working costs of the mines. There are, according to the official returns, nine mines whose profits do not exceed 2s. 6d. per ton, and there are another five mines which would then be in the danger zone or on the borderland of profit-earning. Nine producing mines would have to shut down immediately, involving loss of employment on the part of nearly 2,400 white workers and about 18,500 natives. Moreover, another five mines would be in imminent danger of closing down, involving unemployment as the result, for another 1,600 white workers and 13,000 natives, a combined total of approximately 4,000 white and 31,000 natives. The total number of white employed in May last in all the mines was 23,577, so that the closing down of these fourteen mines would mean that one-sixth of the white workers of the Rand would have no further interest in this industry. Together, the total direct loss under this head will be about £2,400,000 per annum in wages alone if these fourteen mines have to close. The indirect loss, of course, cannot even be estimated. Again, the richer mines which would survive the conditions proposed by the Labour leaders, the stoppage of Sunday milling, etc., would suffer in consequence of the shorter time allowed for running the mill, approximately seven-eighths of the present average time, a curtailment of about one-eighth of their output, which might mean approximately one-eighth less labour required. Thus, out of the 19,000 white workers on these surviving mines, about 2,400 might be without work. Moreover, of the 170,000 natives employed on these surviving mines, also about one-eighth might be unnecessary; that is to say, about 20,000 might have to go. At the same rate of pay as has been calculated on above, the loss in wages would be further £1,600,000, or the continued approximate loss to all mine workers in wages alone of about £4,000,000 annually. In this case also there would be an attendant decrease in the stores and food bills of all the allied workers and trades, with a further decrease of railway traffic, involving further loss for numbers of railway workers and workers in transport generally. Further, it is highly probable that some of the large mines now in the developing stage would have to be shut down for want of funds through the tremendous shock to the credit of the country, if such a sequence of events were to take place. Mr. Webb goes on to show that on the average, for every £1 raised by the gold mines, about 15s. goes to pay the cost of producing it. The workers, industries and people of South Africa get their lion's share of that 15s.; for every £1 which is cut off the production they and their associates lose 15s., the owners and the Government losing on the average 5s. profit. But in the case of the fourteen mines in danger of closing down, practically the whole loss would fall on the workers and producers. The nine mines that would have to close for certain yield working profits which average 1s. 9d. per ton, the working costs being 19s. If the five mines that would be in imminent danger of closing are included, the average working profits of the fourteen would be 2s. 5d. per ton and the average working costs 18s. 8d. In the case of these foutreen mines, therefore, the nominal owners—that is, the shareholders—have, at most, only 2s. 5d. out of every 21s. earned. Out of this 2s. 5d. they have to contribute to the profit tax, direct taxation on claim licences, etc. It is no wonder that many have never paid dividends, and the others only small amounts, although many millions have been spent in their development and equipment. These mines for all practical purposes are ours at least to the extent of say 19s. in 21s. If they are closed the owners only lose a possible and very doubtful 2s. 5d. per ton, while the others—miners, workers, traders, industrialists and railway workers—lose 19s. Even without the actual closing down of these mines the state of uncertainty involved by the Labour policy now happily abandoned, has already caused large numbers of natives to leave the mines. Had the natives continued to go in numbers, the probability is that one mine after another would be so depleted of its labour force that shutting down would become inevitable. It is unnecessary for us here to dwell on the full significance of these facts and figures that speak with an eloquence far above words of the folly of prolonging industrial unrest.

MALAISE OF THE MINING MARKET.

Mining shares, for obvious reasons, are out of fashion to-day among investors. Mr. A. G. Charlton, the well-known London mining engineer, contributes to the financial Press a notable article on the reasons for the present *malaise* of the mining market, and makes some suggestions for improving things in this direction. Since he wrote Rand Labour troubles have intensified the depression as far as South African mining shares are concerned, but that does not detract from the value of his views, as far as they go. His reading of the causes responsible for the present unpopularity of all mining shares may be summed up as follows:—(1) The excellent security and rates of interest yielded by "gilt-edged" securities. (2) Booming trade, calling for all the available cash for investment in industrial business. (3) Mining scandals and over-capitalisation, which have frightened shareholders and done inury to legitimate mining promotions. (4) The higher cost of living, which, leaving them no margin for acquiring interests in mining, has heavily taxed a number of small capitalists. (5) The practical disappearance of the old-time company promoter, who appealed to the public direct. (6) The failure of the public to discriminate between mines of different kinds like those of the Rand, and mines of a more speculative nature, since the lives of mines, like many of those in the Transvaal, are known with almost mathematical certainty, and their revenue and expenditure can be very closely estimated. As a result of this, the uninformed public have been led to expect that the same can be done in all cases, which is not of course, true; and to expect all mining ventures to be of this gilt-edged mining class. (7) The general policy of the big financial houses, into whose hands most of the mining business has drifted—namely, that of giving attention only to developed mines whose "present value" can be calculated fairly closely. (In fact, British engineers are not "prospecting" and London financiers are not backing them in exploring and opening up the "black-blocks" of our Colonies and elsewhere, in searching for promising mineral deposits as they used formerly to do, and one would imagine that the chances, on the whole, were more in their favour now than thew used to be.) (8) The fact that the Stock Exchange are disposed to run mining shares too quickly up to a price at which they will not yield a rate of interest that the public expect in order to give them a fair run for their money. (9) The general state of unrest in countries like Mexico, where the mining industry is extensively carried on, and local labour troubles in Australasia and elsewhere. The last and worst of reasons has a special and ominous significance for the Rand. In future, perhaps, this place will be classed with Mexico and other mining countries as an area menaced by "local labour troubles." Unless the field can be rehabilitated immediately in this respect capital must continue to fight shy of us as it now fights shy of the other unfortunate countries named.

THE TREND OF METALLURGICAL ENGINEERING ON THE RAND.

Will Cams and Cam Shafts be Dispensed With?—An Examination of Tube Mill and Stamp Duty Figures—Randfontein's Record Crushing.

LAST week space was devoted in the columns of this journal to a discussion of tube mill dimensions, and it was then stated that the present tendency is to instal tube mills of lesser length than hitherto. In this issue we publish a letter from Mr. E. Farrar, the chief mechanical engineer of the General Mining and Finance Corporation, on the subject. We are glad to receive Mr. Farrar's letter and are only too anxious to give prominence to his statement that the General Mining and Finance Corporation some years ago discovered economy in the use of tube mills of shorter length than 22 ft. 6 in. The employment of heavy stamps and tube mills has now become general practice along the Witwatersrand, and the economics of tube milling have been carefully analysed. Several admirable papers have been read on the subjects both of heavy stamps and tube mills before local technical societies and the Institution of Mining and Metallurgy in London: as regards the latter body the contributions of Dr. W. A. Caldecott and Mr. H. Standish Ball entitled "The Development of Heavy Gravitation Stamps," and "The Economics of Tube Milling," respectively, demand special commendation. Notwithstanding these most valuable contributions to metallurgical and engineering literature and the equally valuable discussion which they evoked, no one will deny that there remains much scope for further enquiry into the economics of fine grinding and modern milling practice in general.

THE UNIT OF CAPACITY.

As Dr. Caldecott remarked nearly four years ago, "The day of the stamp as a unit of crushing capacity has passed away. The unit of the present basis is the tonnage crushed per month or per day, and this is dependent on many factors—the relative proportion of stamps to tube mills, the actual running weight of the stamps, the ratio of water fed, the height of discharge, the height and number of drops per minute, screening used, and the maintenance of 'concert pitch' in the mill engine." Since Dr. Caldecott made those remarks there has been considerable further development of the heavy gravitation stamp and of the tube mill as a fine grinding auxiliary on the Witwatersrand. The batteries that have been erected since that date have included stamps of 1,500 lbs. and more, falling weight per head. The average duty per head which was under 5 tons per day in 1904-05 and under 6 tons in 1908-09, was 8·84 tons during June. Moreover, of the 53 mines which declared outputs to the Chamber of Mines during that month only 8 did not employ tube mills. In all 9,370 stamps and 274 tube mills were at work. In this article it is proposed to deal with the first point alluded to by Dr. Caldecott, which assists in determining the tonnage crushed—the relative numbers of stamps and tube mills.

A COMPLETE TABLE.

Taking the June figures the numbers of stamps and tube mills, the number of stamps per tube mill at work, and the duties per day were as follows:—

	Stamps.	Tube Mills.	Number of Stamps Per Tube Mill.	Duty Per Day.
Bantjes Consolidated ...	100	3	33·33	10·69
Brakpan Mines	160	8	20	13·53
Cinderella Consolidated	45	2	22·5	7·98
City Deep	150	8	18·75	11·25
City and Suburban ...	155	2	77·5	5·98
Cons. Langlaagte ...	100	10	10	21·49
Cons. Main Reef ...	110	3	36·66	7·23
Crown Mines	660	25	26·4	10·93
Durban Roodepoort ..	90	1	90	5·17
East Rand Prop. ...	820	25	32·8	7·9
Ferreira Deep	250	7	35·7	7·56
Geduld Proprietary ...	50	2	25	10
Geldenhuis Deep ...	300	7	42·8	7·02
Ginsberg	80	1	80	6·77
Jupiter	120	6	20	12·46
Knight Central	110	3	36·6	8·57
Knights Deep	400	11	36·3	8·95
Langlaagte Estate	200	5	40	9·15
Luipaardsvlei Estate .	60	3	20	10·07
Main Reef West ...	100	3	33·3	7·06
Meyer and Charlton ..	75	2	37·5	6·92
Modderfontein B.	80	5	16	14·87
New Goch	120	4	30	8·14
New Heriot	70	1	70	7·12
New Modderfontein ...	180	7	25·7	9·49
New Primrose	160	2	80	5·63
New Unified	60	1	60	7·31
Nourse Mines	260	7	37·1	8·12
Princess Estate	60	5	12	13·39
Randfontein Central ...	900	29	31	9·11
Robinson	250	6	41·66	8·48
Robinson Deep	200	10	20	11·78
Roodepoort U.M.R. ...	50	3	16·6	19·24
Rose Deep	300	7	42·8	7·91
Simmer and Jack ...	320	7	45·7	7·65
Simmer Deep	180	9	20	12·8
Van Ryn	140	6	23·6	10·02
Village Deep	180	7	25·7	9·72
Village Main Reef ...	220	5	44	7·15
West Rand Central ...	20	1	20	5·4
West Rand Cons. ...	100	4	25	12·22
Witwatersrand Deep ...	245	4	61·2	6·83
Wolhuter	120	4	30	8·88

It will be noted that the proportion of tube mills to stamps varied between 1 to 10 (at the Consolidated Langlaagte) to 1 to 90 (at the Durban Roodepoort). The diurnal stamp duty varied between 5·4 tons at the West Rand Central and 21·49 tons at the Consolidated Langlaagte. A closer examination of the figures will show that the relative numerical proportions of tube mills and stamps are not the sole determining factors. Obviously the weights of stamps and the screening used have to be considered in conjunction with the relative numbers of primary and secondary crushing machines in the determination of duty. The enunciation of this fact leads one on to speculation as to what the ultimate limit of the heavy stamp-cum-coarse-screening-cum-tube mills policy may be. The point is perhaps scarcely within the bounds of practical conjecture at this moment, but it is of interest to note that at the Shamva Mines in Rhodesia a daily per head duty for the Nissen stamps of very much more than the present Rand record (that of 21½ tons in the new Consolidated Langlaagte mill) is expected. Everything points to the likelihood of a tendency to further increase the falling weights of stamps, to employ even coarser screening than at present and to increase the number of tube mills (of "short" length) per 100 stamps continuing, and it is not at all unlikely that within the next few years there will be stamps at work on the Rand which will crush 30 tons and over per day. Some metallurgical engineers go so far as to predict that stamps will become heavier and heavier until cams and cam shafts will be abandoned and some other lifting device will be obtained or a heavier blow achieved in some other direction.

700,000 TONS IN THREE MONTHS AT RANDFONTEIN.

As Dr. Caldecott remarked nearly four years ago, "the day of the stamp as a unit of crushing capacity has passed away. The unit of the present basis is the tonnage crushed per month or per day." In this connection attention may be directed to the fact that the Randfontein Central, which possesses the largest gold milling plant in the world, had only one hundred of its thousand stamps idle in June. In April, with 865 heads dropping, 230,820 tons were milled. In May, with the same number at work, 239,166 tons were fed into the mortar boxes, whilst in June 900 stamps were running and 229,285 tons were milled. Thus in the three months this company crushed practically seven hundred thousand tons of ore, an achievement which constitutes a record for any gold mine on earth. We have no wish to weary readers with statements as to the calamitous effect of a general Rand strike. Unfortunately, the result is so obviously disastrous that the point needs no labouring. We would, however, in conclusion, like to point out that the profitable outcome of all the tremendous expenditure to secure the above tonnage at Randfontein was the earning of about seven shillings *gross* profit per ton on a capital of nearly four and a quarter millions sterling. That is the profit result to the shareholder, less, of course, deductions on account of profits tax due to the Government, etc. The result to the worker and the country at large is that previous to the dislocation of operations at Randfontein on account of industrial unrest this company alone was paying out £200,000 per month in working costs.

THE OUTLYING MINES AND THE STRIKE.

All Quiet in the Outside Districts—Operations Unaffected—Some Incidents.

Events of the past few weeks have tended to deflect public attention from the "outside mining" districts of the Transvaal. All interest has centred in the Rand, but whilst the mines of the Main Reef series have been the scenes of unrest, curtailment of output, and disaffection, the outlying propositions, it is satisfactory to learn, have weathered the storm of industrial unrest in a thoroughly satisfactory manner. Indeed, we can learn of no really serious attempts to dislocate the ordinary routine of production at the Premier Diamond Mine, the collieries, the outlying gold mines, and the base metal propositions of the Northern and North-Western Transvaal.

What has made for Peace.

The reasons for this tranquility in a time of tempest are not far to seek. In the first place the majority of these mines are situated at a distance from the centre of unrest which renders the sending of envoys to "pull out" the men a matter of considerable difficulty. Secondly, there is a better feeling of *esprit de corps* amongst managers, staff and miners in the outside districts than obtains on the Witwatersrand. At many of these outside mines the whole community live as a happy family. Each worker is personally known to the management, there are none of the conflicting elements introduced by proximity to large towns, and it is safe to say that were the various mines of the Witwatersrand scattered throughout the Zoutpansberg district there would never have been any question of "downing tools." Such enquiries as we have instituted point to a spirit of content and trust prevailing amongst the employees in the outside districts. For instance, the local offices of the Transvaal Gold Mining Estates, and Glynn's Lydenburg in the Pilgrims Rest—Lydenburg area, have received no intimation of any trouble as between employees and management whatsoever at those mines. So far as is known the Federation of Trades has had no upsetting ambassadors sent to these properties. It is understood that in the Barberton district a similarly peaceful situation has been maintained.

Some Humorous Incidents.

The collieries were at one time threatened, but no trouble resulted. On the contrary one or two pits have never been more active than recently. Breyten, for instance, had an output of about 40,000 tons last month, a production which must practically constitute a record for that mine. Of another important colliery an amusing story is told. A small body of strike envoys marched to this mine. On arrival they were met by the principal shareholder, informed that the men there had no grievances and were not coming out. The envoys seemed to accept the situation with philosophy, and the magnate entertained them to a sumptuous breakfast, after which they departed. The situation has certainly had its touches of humour as well as its chapters of tragedy and distress. Another "strike that failed" incident is recorded of a certain mine in the northern part of the Province. One blustering striker of the wild west bullying type was despatched there. It is said that he was indiscreet enough to brandish a revolver with a view to putting a finishing touch on his anarchial oratory. Unfortunately for him, the employees had no wish to "down tools," and they resented the presence of the ambassador from the Trades Hall. His revolver was taken from him and he was administered a useful hiding, after which he was handed over to the police and "deported." At the tin mines there have been no labour troubles. It is understood that at one mine the men stated they would go out on shooting expeditions if the situation became acute, but it was all said in a friendly spirit and it was mutually agreed that the men should return to their billets. Some of these base metal properties, even in the event of a general strike, could have maintained a substantial rate of output by using the native labour available for bagging rich ore. Altogether, then, it seems that the outlying districts of the Transvaal have weathered the storm most satisfactorily, and whilst the Rand has been an armed camp of unrest the mines of the veld and bush have preserved the even tenour of their way without any serious intervention on the part of the spoilers of industry.

Capetown Tramways.

The report of the Capetown Consolidated Tramways and Land Company, Limited, for 1912, states that a balance of £1,678 is shown to the debit of profit and loss account for the current year, which, added to the balance brought forward from 1911 of £4,628, makes the total to the debit of profit and loss account of £6,306 to be carried forward to next year. No dividends have been declared by the subsidiary companies during the past year.

Mozambique Macequece.

The report of Mozambique Macequece, Limited, for the year ended December 31 last states that the result is a debit balance of £1,619. The funds in bank and amounts due by sundry debtors, less due to creditors, amount at December 31 last to £4,866, as compared with £6,530 on December 31, 1911.

Selukwe Columbia.

A report from the company's engineer in Rhodesia shows that the ore in the Yankee Doodle Mine will be exhausted in a short time, and the mill temporarily closed down. Development on the Wonderland Block of claims is being pushed ahead as rapidly as possible with encouraging results. Indications on this block of claims, as well as on the Danga and Chimborazo Blocks, all of which were lately acquired, tend to show that a payable shoot of ore of considerable length will be opened up, and it is hoped, after some further work has been carried out, to erect an aerial ropeway and surface equipment, and again utilise the present reduction plant. The financial resources of the company are quite sufficient to bring these areas to a producing stage.

FIFTEEN MILLIONS OF UNREMUNERATIVE CAPITAL.

The Plight of the Poorer Mines—Inevitable Consequences of a Strike.

Of the fifty-three mines which declared outputs to the Chamber of Mines in respect of the June, 1913, operations, twenty have not declared dividends for the first half of the current year. Of these the Lancaster merely recorded a small final clean-up, whilst the Spes Bona is a privately owned concern. The eighteen others had a capital in issue of over fifteen millions sterling. The name of the New Kleinfontein might also be added to the list. This concern, although it did not declare any output for the month on account of the strike, is under normal circumstances a regular producer of gold; the capital in issue being £970,000. Appended is a list of the mines in question—the non-dividend declarants—together with figures as to their average recoveries per ton and average profits per ton.

Mine.	Issued Capital.	Recovery per ton. Dwts.	Profit per ton. s.	d.
Aurora West	£106,352	6·29	8	6
Cinderella Cons. ...	1,159,450	7·93	3	3
Cons. Langlaagte ...	950,000	6·03	9	4
East Rand Prop. ...	2,445,897	6·92	10	6
Geduld Proprietary ...	875,000	6·24	3	0
Glencairn	550,000	3·38	2	6
Jupiter	1,014,200	4·85	1	7
Knight Central	900,000	5·47	3	2
Luipaardsvlei Estate	172,012	5·3	3	10
Main Reef West ...	491,188	7·2	7	0
New Goch	550,000	4·68	1	0
New Rietfontein ...	610,084	5·17	3	0
Princess Estate ...	575,033	6·11	1	10
Roodepoort U.M.R. ...	160,000	4·7	3	1
Simmer Deep	1,650,000	3·79	1	5
Vogelstruis Estates ...	224,929	5·19	3	7
West Rand Central ...	100,000	7·41	4	0
West Rand Cons. ...	2,004,424	6·63	6	10

Those who are loud in their denunciation of the mining companies as mere dividend-earning machines for foreign capitalists would do well to take the figures to heart. It will be seen that at most of these mines the margin of profit is very small, whilst the grade of the ore is such as to admit of little possibility of improvement. In the event of further serious depletion of native labour complements the majority of the mines noted in the above schedule would have to close down immediately, and it is certain that a number of them would not resume operations. The effect of the application of closure at these mines would inevitably react on the workers themselves. The obvious consequences would be so appalling that it is difficult even at this eleventh hour to imagine that the Labour leaders will urge the continuation of a fight which must inevitably throw hundreds of white workers permanently out of employment as well as destroy confidence in the mineral industry of the Rand.

Training with Mine-Rescue Breathing Apparatus.

The U.S.A. Bureau of Mines, in its endeavour to aid in decreasing loss of life and property in mining operations, is demonstrating the use of mine rescue breathing apparatus and is training miners to use such apparatus under the conditions following a mine disaster. A publication of the Bureau, Miners' Circular 4, "The Use and Care of Mine-Rescue Breathing Apparatus," discussed the construction of different types of breathing apparatus, the precautions to be observed in using such apparatus, and the general course of training recommended by the Bureau. Because of the great interest that has been taken in the work of mine-rescue and first-aid corps and in the establishment of mine-rescue stations, the Bureau is issuing another report in order to present in detail the methods of training that it recommends, and to point out the necessity of maintaining the efficiency of mine-rescue corps by frequent training. Systematic training is essential to insure the safe use of any type of breathing apparatus. The quantity and the quality of the air supplied by some types of these apparatus have certain limitations, and the wearer of an apparatus must be familiar with its construction and its operation before he undertakes to wear it under the conditions of rescue and recovery work in mines. There is some difference of opinion among persons who have worn breathing apparatus in actual mine-rescue work as to the length of time a man should be required to receive training with the apparatus before he is to be considered as qualified to engage in mine-rescue or recovery work. All, however, admit that it is necessary for a man to take regular training at stated intervals in order to keep in proper condition for wearing the apparatus in cases of emergency. Whether the duration of the intervals be two weeks or three months, some system of regular practice should be adopted. The U.S.A. Bureau of Mines requires each of the miners it employs at its mine-safety cars and stations to take two hours' practice in vitiated air once each week. At mines where rescue stations are established, the regular mine-rescue corps should be required, after completing their preliminary training, to undergo practice at frequent intervals. In localities where rescue stations and apparatus are not available, it is of course impracticable for persons who have received preparatory training to keep up regular practice. Such practice, however, are very valuable in time of a disastrous explosion, since their training and instruction in the use of the apparatus enables them to be of great assistance to a crew of rescuers who may arrive with breathing apparatus.

Mining Prospects in German S.W. Africa.

The *Neue Münchener Tagblatt* states that, in addition to wolfram deposits at Gründorn, in the concession of the South African Territories, and silver-lead occurrences near Aiais and Kanibes, occurrences of gold and copper ore have recently been discovered on the farm Kunjas, in the vicinity of Lüderitzbucht. On the wolfram fields the S.A.T. company has pegged out claims covering 15,000 hectares and commenced serious prospecting works along four parallel lodes all outcropping. The ore is stated to carry 5 per cent. wolfram, and even better results are expected in depth. The silver-lead ore deposit extends over an area of 7,000 hectares: half of it the S.A.T. company has reserved for itself, and the other half has been pegged out by private prospectors. Development work has been actively proceeding, and an inclined shaft has been sunk to a vertical depth of 90 ft. The ore is said to contain from 30 to 80 per cent. lead, and from 400 to 2,000 grammes silver per ton. A private tramway from the property to the Seeheim-Kalkfontein railway line is to be constructed as soon as the necessary capital has been found. The copper ore lodes on Kunjas farm have been thoroughly examined by experts in the service of the Deutsche Kolonialgesellschaft. Samples from the outcrop are said to show excellent values. About 7 kilometres from the copper occurrence several lodes of auriferous ores have been observed. They have been traced by their outcrops over a distance of 15 kilometres; assays are stated to have given excellent results. More than 150 prospecting claims for precious minerals have already been pegged out. The distance of the field from the nearest railway station is about 110 kilometres.

Wanderer (Selukwe).

The report of the Wanderer (Selukwe) Gold Mines, Ltd., for the year ended April 30 last, shows that the result of the year's working is a net profit of £11,377, making, with the balance brought forward from the previous year, £19,860 at the credit of the profit and loss account. The tonnage crushed and treated was 222,445, and was the largest quantity dealt with in any one year. The ore reserves at April 30 last were estimated to be 67,931 tons, of which 15,321 tons are pyritic ore in the Ashton Mine and not yet amenable to the present treatment. As regards the various sections of the property, the Wanderer itself is now the only section from which further considerable quantity of payable ore is expected.

RECENT PROGRESS WITH THE ALBU GROUP.

Quarterly Reports Examined—Valuable Development Statistics—Milling Figures in Detail.

The value of the quarterly reports of subsidiary companies of the General Mining and Finance Corporation is much increased by inclusion of particulars as to development results secured. In the statements as to operations for the three months ended with June last now before us, figures as to feet driven, sunk and risen, and disclosures of reef are given with admirable fulness. Underneath the statistics are summarised in convenient form. Attention may be directed to the better results attending development in the Roodepoort United Main Reef and also to the high grade values over good width in the Meyer and Charlton.

	Number of Feet driven, sunk and risen.	Footage sampled on Reef.	Average Stoping width Inches.	Average Assay value over stoping width payable.		Low Grade.	
				Feet.	Dwts.	Feet.	Dwts
Aurora West	3,360	3,190	41·35	1,755	8·91	1,435	2·4
Cinderella Consolidated	2,571	1,685	38·9	600	8·91	1,085	1·97
Meyer and Charlton ...	1,186	905	46·1	605	14·9	300	1·58
New Goch	1,413	1,148	61	868	8·15	280	3·2
Roodepoort U.M.R. ...	4,738	2,543	38·42	1,807	7·42	736·5	2·44
Van Ryn	4,028	2,360	39	1,331	7·8	1,029	2·0
West Rand Cons. ...	5,400	2,936	46	2,156	8·7	780	2·5

As to milling results the salient figures are:—

	Ore Milled.	Revenue.			Cost.			Profit.			Capital Expenditure.
			Per Ton.			Per Ton.			Per Ton		
		£	s.	d.	£	s.	d	£	s.	d.	£
Aurora West	43,535	57,550	26	5	42,719	19	7	14,830	6	10	2,676
Cinderella Cons. ...	42,270	55,781	26	4	60,317	28	6	*4,536	*2	2	21,973
Meyer and Charlton...	43,928	101,232	46	0	38,201	17	4	63,031	28	8	2,638
New Goch	82,850	81,792	19	9	66,676	16	1	15,116	3	8	2,235
Roodepoort U.M.R. ...	85,401	77,919	18	3	70,297	16	5	7,652	1	9	8,986
Van Ryn	103,850	151,006	29	1	84,334	16	3	66,672	12	10	1,433
West Rand Cons. ...	95,000	136,217	28	8	104,501	22	0	31,715	6	8	22,405

* Loss.

The working profit of the Aurora West shows an increase of £1,193 9s. 10d. over that for the previous quarter: the improved results are due chiefly to a reduction in working costs of approximately 1s. per ton. The revenue from gold as shown in the Cinderella Consolidated's statement of expenditure and revenue includes the value of the gold recovered from the plates and extractor boxes in the end-monthly clean-up for June. The final clean-up of the mill and cyanide works has since been made, resulting in the additional recovery of 588 ozs. of fine gold of an estimated value of £2,500, besides which there are by-products on hand which are estimated to realise £750. A percentage of 4·169 per cent. of the net produce from mining operations is payable to the Government in respect of certain undermining rights leased to the company. As stated in the circular letter to shareholders on the 4th instant, milling operations were suspended on the 25th June in accordance with the recommendation of the company's engineer. Work on the mine is therefore now concentrated on the development of the Cinderella Deep section, the driving of the 5th level east which will form the main connection between the present working and the central section of the property, and the continuation of the sinking of the new central shaft in the latter section. Up to the end of the quarter under review, the 5th level east (connection) drive had reached a total length of 2,663 feet, of which the 1,875 feet driven and sampled on reef gave an average assay value of 8·7 dwts. over a width of 54 inches. The last 105 feet driven and sampled disclosed an average value of 15 dwts. over 23 inches, but the full width of the reef is not exposed in the drive. Central shaft: During the quarter 338 feet were sunk, making the total depth of the shaft 2,904 feet at the end of the quarter. A percentage of 10·8668 per cent. of the net produce from mining operations at the Meyer and Charlton is payable to the Government in respect of certain undermining rights leased to the company. The amount of £8,648, standing in the balance sheet at the 31st December, 1912, under "Gold Reserve Account," has since been transferred to profit and loss account for the current year, in addition to a further £1,614 accumulated since that date, making in all £10,262. Exclusive of this amount, the working profit is £3,184 18s. 2d. in excess of that for the preceding quarter. Working costs show a reduction from 18s. 3·65d. for the previous quarter to 17s. 4·45d. per ton. The treatment of accumulated slimes was completed on 8th May. At the New Goch the working profit shows a decrease of £3,768 10s. 10d. (due to the slightly reduced grade of the ore milled) as compared with the previous quarter. The abnormally low recovery value and working expenditure per ton crushed during the quarter at the Roodepoort United Main Reef are due to the inclusion in the ore milled of a comparatively large percentage of surface development dump rock of low grade—the treatment cost of which is also correspondingly low. Practically the whole of the white workmen employed on the Van Ryn property came out on strike on the 19th June, in sympathy with the men on strike on a neighbouring mine. Active operations were necessarily suspended for the remainder of the month, with the result that the tonnage milled for the quarter under review shows a decrease of 12,150 tons, and the working profit a reduction of £6,178, as compared with the previous quarter. Milling operations were resumed on the 9th July on the termination of the strike. Dividend No. 19 of 25 per cent. (5s. per share) has been declared for the past half year, making a total distribution of 47½ per cent. for the financial year of the company ended 30th June. The working profit of the West Rand Consolidated shows an increase of £6,838 2s. 1d. as compared with the previous quarter, owing to some extent to an increase in the tonnage milled, but chiefly to a reduction of 2s. 2d. per ton in working costs. At the developing mine of the group, the Rand Collieries, during the quarter the total footage accomplished was 1,196 feet, the whole being at the horizon of the 10th level, and made up as follows:—North drive (291-825½), 534½ feet; south drive (216-564), 348 feet; winze (97½-331½), 234 feet; other footage (crosscut, winzes, etc.), 79½ feet; total, 1,196 feet. In addition 109 feet of diamond drilling were effected. The north drive was driven throughout on reef. The 520 feet sampled during the quarter gave an average value of 1·7 dwts. calculated over an assumed stoping width of 36 inches. The south drive was extended 100 feet on reef, giving an average value of 2·9 dwts. calculated over an assumed stoping width of 36 inches. A dyke about 50 feet in thickness was then encountered: this has been passed through, and cross-cutting west is now in progress to pick up the reef.

THE MINES' OFFER TO THE MEN.

Employers' Reply to List of "Demands"— Important Concessions in Detail.

THE Minister of Mines has issued the following document for publication: *Memorandum dealing with the demands submitted to the Government by the Transvaal Federation of Trades Unions directly concerning the gold mines of the Witwatersrand.*

GENERAL DEMANDS.

(A) EIGHT HOURS BANK TO BANK.

In order to minimise the time occupied in getting the white men to and from the working places, it is agreed that the normal time to be allowed shall be thirty minutes; in special cases the Minister of Mines to grant such extension of time as he may deem necessary

(B) HOLIDAYS.

After twelve months' continuous service underground, or two years' continuous service on surface work on any one mine, ten days' continuous vacation on half pay to be granted to all white workmen on day's pay (by arrangement with employers as to dates), to take effect from the 8th of July, 1913. The arrangement for work and pay on Christmas Day and Good Friday to remain as at present.

(c) SICK AND BENEFIT SOCIETIES.

No objection to be offered to a Bill providing for a general scheme for Sick and Benefit Societies for the mines. Participation in it shall be optional, the decision of the men on each mine as to whether they will participate in such scheme to be decided by ballot.

(2) IMMEDIATE DEMANDS.

(2) RATES OF PAY FOR TRANSVAAL AND ORANGE FREE STATE; (3) UNDERGROUND WORKERS (SKILLED); (5) OVERTIME; (6) NIGHT WORK.

The employers are unable to agree to any increase of the present wages, but are prepared to give evidence before a Special Commission of Inquiry, to be appointed for the purpose by the Government, as to the amount which should constitute a fair wage for the various branches of work, having regard to the cost of living and other conditions on the Witwatersrand. With regard to Saturday morning shift, the employers are unable to make a general concession, but are willing, where circumstances permit, to arrange for the Saturday morning shift to start at 6 a.m. and to end at 2 p.m., if the men concerned desire it.

(4) APPRENTICES.

The employers are not prepared to agree to this proposal, as they do not consider it to be either workable or in the interest of the country at large.

(7) POWER STATIONS.

The gold mining companies, so far as this proposal affects them, are unable to agree.

(8) UNDERGROUND DRILL SHARPENERS.

It is agreed that before any drill sharpening is performed underground a certificate must be obtained from the Inspector of Mines to the effect that the working place is sanitary and well ventilated.

(9) MINE EMPLOYEES' TENANCIES.

It is agreed that when a gold mining company gives notice to married workmen resident on the property the workmen shall not be bound to vacate their houses within one month, provided the rent is paid.

(11) WEEKLY WAGES.

The employers are prepared to adopt the system of weekly payment to men on day's pay.

LIST OF GRIEVANCES.

With regard to the following list of "grievances" which has been handed in to the Government by the Transvaal Miners' Association, in addition to those already made public, the employers submit the following comments:—With reference to: "(a) We demand an eight hours' day bank to bank." This has already been dealt with under (1) General Demands (a). "(b) That if a man works five night shifts, he shall be paid the value of six shifts, and, in any case, that all night shifts worked shall be paid for at time and quarter, but in no case within one week shall there be more than five night shifts worked, and that in any case Saturday night shifts be abolished." (c) That we reiterate the demands put before the Conciliation Board above referred to in toto, and demand that the agreement marked 'B' annexed to the application above referred to of October, 1912, be the agreement for future underground contract work, and we further demand that the recommendations of the Conciliation Board above referred to, in so far as they are not inconsistent with the demands contained in Agreement B shall be carried out. (d) That the minimum wage for the undermentioned mine workers shall be as follows. Machinemen, 25s. per shift, hand stopers, 2[illegible]s. per shift, ordinary timbermen, 20s. per shift, learners, 7s. 6d., and after two months 10s., and after six months 15s., and after nine months to come under the minimum as skilled workers in their respective classes of work; onsetters and trammers, 16s. 8d. per shift, developers, 30s. per shift; shaft timbermen and sinkers, 25s. per shift; skipmen, 20s. per shift." With regard to (b), (c) and (d) the employers are unable to agree, but in so far as questions of wages are concerned refer to their replies under the head of (2) Immediate Demands (2), (3), (5) and (6). "(e) The abolition of discharge notes at present in vogue." The employers cannot consent to this proposal. "(f) That change houses be better conducted than at present, and preferably on the lines on which change houses in Kimberley are at present conducted, where, for instance, the clothes are dried and put in lockers. (g) That the Transvaal Miners' Association shall be allowed and shall have the right to appoint one-third of the total number of mine inspectors on the Witwatersrand as vacancies occur, that is to say to fulfil the ordinary duties of ordinary inspectors of mines, but that in addition to these there shall be two local inspectors to be called examiners on each mine to be appointed by the local branch of the Transvaal Miners' Association, who shall have the right to be present at each inquiry by an inspector of mines into any accident which may occur on any mine, and who shall have the right to call and examine witnesses under oath and generally exercise the right of an inspector of mines in respect of such inquiry at any such inquiry." With regard to (f) and (g) these are matters under the control of the Government, and in the opinion of the employers all inspectors should be appointed by the Government. "(h) That no person be appointed a shift boss who has not had three years' experience as a practical miner, including one year's practical experience on the Witwatersrand." The employers cannot concede this. "(i) That the allowance or compensation payable in respect of miners' phthisis be brought as to amount into line with the Workmen's Compensation Act, that is to say that persons suffering from phthisis in the first stage shall receive a sum of £375, and in the further stage an amount of £750, and that, if paid monthly, the instalments shall not be less than £15 per month." This is a matter for the Government and Parliament. "(j) That after one year's service on any mine or mines a fortnight's holiday shall be granted on full pay to every man in respect of each year's service past or future, from and including the year 1912 onwards." This has already been dealt with by (1) General Demands (b). "(k) We demand the abolition and repeal of the present Industrial Disputes Prevention Act, 1900. (l) We demand the abolition and repeal of Act 6 of 1894. (m) We demand that the Inquest Law of the Transvaal be reinstituted, and be in force, and that inquests should be held in every case for the future as if that law had never been amended. (n) We demand the 4th day of July in each year as a legal public holiday (to be called Labour Day) to apply to mine workers in the same way as Christmas Day and Good Friday." (k), (l), (m) and (n) have been dealt with by the Government. "(o) That the right of employees to make any representations to their employers through their unions shall be made law, or, in other words, that it shall be a law that trade unions be recognised." With regard to the official recognition of individual trade unions the employers are in principle agreeable to such recognition, subject, however, to the approval of the employers of the constitution and by-laws of the unions and the settlement of the conditions on which such approval should take place, such as and including the following:—That the unions shall: (1) Be incorporated and that none of their funds shall be used nor shall any levy be made for political purposes. (2) Consist solely of mine employees. (3) Be controlled by a committee of such employees elected by ballot. (4) Represent a considerable portion of such employees. (5) Not interfere in matters of discipline or management, but address their representations to employers. (6) That mine employees or sections of them may make representations to the employers without reference to the unions if they so desire. "(p) That no one under the rank of a mine captain shall be entitled to discharge any employee from the service of a mining company." The employers agree to this point. "(q) *Re* Blasting Certificates.—That a board of examiners shall be appointed to deal with the granting of blasting certificates for miners, and that this board shall consist of three members, one to be appointed by the Government, one to be appointed by the Transvaal Miners' Association, and the other to be an inspector of mines, and that such a board shall be formed in respect of each district in the Witwatersrand gold fields." This is a matter for the Government, but in the opinion of the employers, the adoption of this proposal is undesirable. "(r) That every man shall be entitled to whatever is due to him not later than twenty-four hours after the termination of his employment, and that, failing such payments, he shall be entitled to a further payment calculated per day at the rate of the remuneration he has earned per day." The employers cannot agree to this, as the proposal is impracticable. "(s) That all men brought in contact with dust, whether on the surface or below ground, such as crushermen, batterymen, etc., and who contract phthisis, shall be entitled to compensation on the same basis as underground workers." This is a matter for the Government to consider. "(t) We demand the abolition of all Sunday work on or in the mines, including all reduction, battery and other surface work, from 12 o'clock midnight on Saturday till 12 o'clock midnight on Sunday." This is a matter for the Government, who are waiting the report of tho Sunday Observance Commission. "(u) That in all inquiries by mining inspectors only properly qualified and duly certificated interpreters shall be employed." This is entirely a matter for the Government. "(v) That not less than one month's notice be given for cutting of prices, wages or other remuneration of any mine workman." This proposal is provided for in the present Industrial Disputes Prevention Act. "(x) Any man shall have tho right to enter for examination as a mine captain if he has had four years' practical experience, whether he has been a shift boss or not." Tho employers are agreeable to this. "(y) Garnisheeing Wages.—We demand the following accepted by the Select Committee on Garnisheeing Wages: "That your committee strongly recommends that before granting a garnishee order in respect of salaries or wages the Court to which application is made shall satisfy itself that a sufficient amount of the salary or wages proposed to be attached shall be left to the debtor to enable him to maintain himself and those dependent on him, and tho garnishee order shall only apply to the balance of such salary or wages." This is a matter for the Government to consider.

REDUCTION MEN'S SECTION.

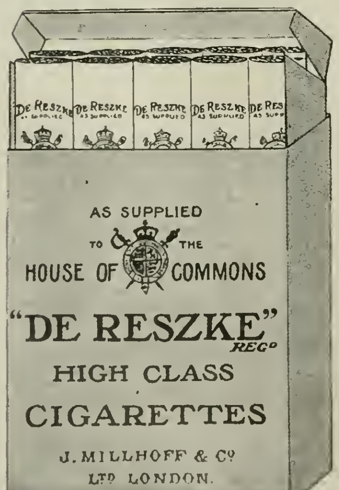
All these demands are covered by the replies given to previous questions either by the Government or by the employers. With regard to point (1), the matter of 48 hours a week for reduction men is a case for inquiry. Clause (2) as to holidays is dealt with in Clause (1) Section (b). With regard to Clause (3) as to two weeks' holiday, the employers are agreeable to the holidays remaining as at present so long as the system now in vogue as to reduction works continues. We are agreeable that all the other points raised under this head should be referred to the Special Commission, with the exception of No. 13, the scope of which it is impossible to determine.

"UTMOST CONCESSIONS."

The following official note has been issued by tho Minister of Mines, with reference to a recent meeting between himself and Mr. Watson, President of the Federation of Trades, and Mr. Tom Matthews, who were Federation representatives deputed to interview Mr. Malan. The Minister says: "The representatives of the mining industry deem it necessary to state that these resolutions contain the utmost concessions to workmen which it would be possible for them to make in justice to the industry, and they are put forward only with a view to the establishment of permanent industrial peace. They are convinced that any extensions of these concessions would involve the closing of a very considerable number of mines as unpayable propositions, with consequences to every section of the community, on which it is needless to enlarge." The Minister stated that the Government trusted that the way in which the grievances proffered by the deputation on behalf of the mine workers had been met by them, and the very substantial concessions made by the representatives of the industry would lead to the establishment of stable industrial conditions on the Rand, and to the removal of the serious risk of the unsettling of the minds of the large number of native employees on the Rand, which must have the effect of reducing the available number of unskilled workmen, and thereby causing a corresponding contraction of the field for white employment.

Swaziland Tin.

The following are the particulars in regard to operations for the month of June, 1913:—Concentrates recovered, 32,509 long tons; estimated profit (taking the price of tin at £180 per ton), £1,761; adjustments in respect of previous shipments due to fluctuations in the price of tin, to be added, £204; profit for the month, £1,965. The decreased output was due to stoppages to permit of changing over to gravel pumps. £240 of special expenditure, which will not recur, were charged out for the month. An improved output is expected for July. Two gravel pumps are now working and are proving most satisfactory.



Moodies.

An extraordinary general meeting of shareholders in the Moodies Gold Mining and Exploring Company, Limited, was held in mail week. Mr. E. W. Cox-Moore, who presided, explained that the meeting had been called to alter the articles of association, so as to provide for the control of the company's affairs being exercised in London instead of in South Africa. At a meeting of the European shareholders, held in London in March, 1910, representations were made to the South African Board to the effect that as 90 per cent. of the shares were held by persons residing in Europe, the company should be managed from that side. The South African Board had now agreed to the change. The resolutions were unanimously adopted.

Middelvlei Estate.

The ordinary general meeting of shareholders of the Middelvlei Estate and Gold Mining Company was held on Wednesday, Mr. F. D. P. Chaplin, M.L.A., presiding. There were also present Messrs. D. Christopherson, W. S. Smits, L. Knaupp, H. Robins, G. Hesse, D. W. Rossiter, W. Saugster, F. H. Cowan, and C. Hely Hutchinson, secretary, representing 25,137 shares out of an issue of 160,945. The chairman, in moving the adoption of the report and accounts, said : You will see from the report and accounts now before you that the position is practically the same as it was this time last year. The company has cash to the amount of £10,824, of which £10,800 is on fixed deposit. No encouraging information has been gained from any mining operations in the vicinity. On the other hand, it cannot be said that the property has been proved to be valueless from a mining point of view. You will see that the revenue received during the year from rents, dividends and interest, amounting in all to £451, exceeded the expenditure by £37. I now beg formally to move the adoption of the report and accounts. The report and accounts were adopted. The retiring directors, Messrs. F. D. P. Chaplin, D. Christopherson, and W. S. Smits, were re-elected. Mr. Thomas Douglas was reappointed auditor.

The report of the Bulawayo and General Exploration Company (1906), Ltd., for the year ended March 31 states that the result of the year's working shows a considerable improvement as compared with the previous year. There is a balance available to the credit of the profit and loss account of £4,021, including £339 brought forward, but excluding a dividend amounting to £2,400 received on certain shares acquired by the company shortly after the purchase thereof was completed, which sum, together with £600 to be transferred from the profit and loss account, making £3,000 in all, the directors propose to place to the credit of an investment reserve account, to be held against any depreciation in the investments, and this reserve is to be increased from time to time as profits may admit. The board propose tho payment of a dividend of 5 per cent. free of tax on the fully paid shares, and a proportionate sum on the partly-paid shares. This distribution will leave a balance of £806 in the profit and loss account after the £600 above referred to has been deducted, which it is proposed to carry forward.

PREVENTION OF ACCIDENTS FROM FALLS OF ROOF.

Points from an Important Pamphlet Issued by the U.S.A. Mines Bureau.

IN view of the article in our last issue on the prevention of falls of roof in stopes—which we understand has attracted considerable attention—the following extracts from a pamphlet just published by the U.S.A. Department of Mines on falls of roof in coal mines is of value. By way of preliminary, it may be said that in discussing the causes of such accidents as those from falls of roof little is to be gained by declaring that the miners or that the mine owner is mostly to blame. As a matter of fact, neither the mine owner nor the miner alone can entirely prevent such accidents. Each has his part to do; each is responsible for doing his part well. If the miners will co-operate with the mine owner and the mine owner will co-operate with the miners in an earnest effort to prevent these accidents, many lives will be saved. Let both the miner and the mine foreman also co-operate with the mine inspectors in their efforts to safeguard life. Let " safety first " be our motto and guide both in practice and in theory, and the mining industry on the Rand will become as safe as that in any other country, and there will be ample public approval and assistance in promoting both the welfare of the miner and the welfare of the industry. In the following extracts the word " operator " is used in the usual American sense of mine owner.

PREVENTION OF ACCIDENTS FROM FALLS OF ROOF.

It is the belief of many mining engineers that most falls of roof are not necessary. The principal causes of accidents from falls are the following :—

(1) Failure to use sufficient props or timbers.
(2) Going back to the face without testing the roof after shot firing.
(3) Undermining the inner edge of a block that seems to be safe, but actually is loose.
(4) The sudden loosening of a concealed " pot," " kettle bottom," " bell," or a fossil stump.

The first two causes, which result in the largest number of accidents, are generally avoidable; the second two may generally be avoided by setting the props or timbers close enough together, but some accidents from these two causes may be considered unavoidable.

A WORD TO THE MINER.

Now, how can you, the miner, escape harm from a fall of roof in your working place? The answer is : Be careful. Two parties are interested—the operator and yourself. In this case, at least, the interests of the operator and your own are alike—falls should be prevented. If an accident happens the operator suffers a money loss, but you may be made a cripple for life, a burden on your family or the community; or you may be killed and leave a dependent family. Hence, it is necessary that you, as the one most vitally concerned, must take the most extreme care to prevent these accidents. Remember, it is the unexpected that often happens. On the other hand, the operator, or the foreman or boss who represents him, must do his part—that is, furnish the timber. The laws of nearly all the coal-mining States require the operator to furnish the necessary props or timber at or near the working place Sometimes, through delays in the haulage, or more rarely through the carelessness of a foreman or boss or driver, the timber is not received at the time you need it. If the timber does not arrive you should not take a great risk in going without it and work under an unsafe roof. Important as your daily earning is to you, the delay of one or two hours, or even a whole shift, is as nothing compared with being killed, or becoming a cripple for life, by having a piece of roof fall on you. Remember your family or those dependent on you, and wait for props.

TESTING THE ROOF.

When you enter your room or working place in the morning you should proceed slowly, watching the roof carefully with the light from your lamp thrown upon it. If any place seems doubtful you should test it with a pick or a heavy stick, touching the roof or doubtful piece with your free hand. If any vibration is felt, the piece is unsafe, and must be taken down or timbered at once. The " sound " of the roof may often be deceptive if the loosened piece is large. If the roof is too high to reach with the hand, a stick should be held against the doubtful piece, and if the piece is loose you will feel the vibration through the stick. This is the approved and adopted method of certain large mining companies who have found from experience that the old method of " sounding " the roof is unreliable. Take a pick or bar with you for testing and pulling down loose pieces of roof as you go toward the working face All the untimbered roof in the space through which you work during the day should be carefully tested before you do anything else. If a loose or threatening piece is found it should be pulled down, or else a prop or props set under it, or, when necessary, bars, straps, or collars should be used. This should be done before any other work is started. At intervals in the day, or whenever you change your working point in the room entry, or heading, the roof should be examined and tested. If you are running a machine, you should see that the roof is carefully tested before each cut is made and is tested again after the cut. Do not take the risk of finishing a cut or loading a car before putting up a prop; a moment's delay may cost your life. If you have difficulty in getting timber promptly, you have a just cause for complaint to the mine foreman. No responsible operator will support a foreman or superintendent in refusing to give you timber enough, and to give it promptly. It is not to the operator's interest to do so, and, moreover, he would not be obeying the law of the State. Even in those States where the wording of the law is not explicit in this respect, no court will support his refusal. That, however, does not help you at the time; the blame for working when timber is not provided rests on you.

It is impossible in a brief circular of this kind to describe the methods of timbering that should be followed under each of the various conditions of coal mining in this country. Generally certain methods of timbering (not always the best methods) are used in each district. In some cases the State inspectors have made certain rules for placing timbers in advancing rooms and drawing pillars. Where such rules have been made, or there are mine rules, they should be carefully followed. But these rules are not always sufficient: they cover the average case, but not an extreme or special condition—that is, it may be the rule of the district or mine to set two or three lines of props in a room, the props to be not over five or six feet apart, whereas in some rooms four or five lines of props may be necessary. It is important to set the props at regular intervals, and in some places to set extra props as they may be needed. If the roof seems to be in bad condition, do not hesitate to set a temporary post at the face to protect yourself while loading a car. Timber the place, if necessary, even though the post is in your way. Don't wait until the car is loaded, for the roof may fall on you. Keep proper tools on hand with which to do timbering. Do not neglect to timber your place properly, even if you are in a hurry or feel that the top is all right because it usually is good, nor neglect to do so because timber would not allow you the same freedom to work. This neglect, if continued, will result in someone being hurt or killed. In coal mines in France, which generally have a weak shale roof, the rules require that the props shall be placed not over one meter (3½ feet) apart each way, and that there must be hitches cut in the coal face and straps or bars put in, supported by the props behind, before the miner is permitted to undercut the face. The good results of this law is shown by the records of accidents in the French mines. In spite of the poor roof, the number of accidents from roof falls in proportion to the number of underground employees is lower than in any other country.

EFFECT OF EXPLOSIVES.

Great damage is done to a roof by the use of too much explosive for a shot, and by not placing shots properly. If the hole is drilled too close to the roof, the blast tends to shatter it. Do not place the shot too near the roof. If the coal is not undercut or properly sheared, a great deal of the force of the explosive is spent in shattering the roof. Also, props may be blown down. You should watch closely to see that you use just enough explosive to bring down the coal. This will not only lessen the cost of the explosive and increase the proportion of lump coal, but it will lessen the risk of accident from an explosion or fall of shattered roof which might kill or cripple you. When you go back after firing a shot, it is particularly necessary that you thoroughly test the roof in the way previously described. You should not go back under any condition while the smoke is thick, both on account of the poisonous gases and because you can not then properly observe the condition of the roof or whether props have been thrown down.

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HISTORICAL REVIEW OF VACUUM FILTRATION.

[By A. M. Merton.]*

That vacuum filtration has done much towards stimulating the development of the modern "all sliming" metallurgical processes in undoubted. However, the last word in filtration has yet to be uttered. There are not a few metallurgists who predict that the sluicing filter press will eventually displace most of the vacuum filters except perhaps in some fields where special conditions exist. At a competitive test in a Mexican mill all the best known filters were represented and a press was an easy winner over all vacuum machines. The soluble losses and working costs were lower and the first cost per ton of capacity was favourable. Moreover, owing to the high pressure of operation there is considerable dissolving action in the press, resulting in lower tailings. So the war of opinion wages, some authorities upholding one side and others, equally distinguished, maintaining the other. Without entering the field, either on one side or the other, it may be of interest to trace the development of vacuum filtration. Undoubtedly the prototype of all vacuum filtration machines is the Gooch vacuum filtering cone introduced in the early part of the eighties and widely used as a piece of laboratory apparatus for the last thirty years. It consists of a cone, the base of which is perforated with fine holes. The cone is connected by a piece of heavy walled suction tubing with a filter bottle which in turn is connected with a water pump. The filter medium is formed of ordinary filter paper which, under the atmospheric pressure induced by the vacuum pump, adheres firmly to the base of the cone. The cone is now immersed in the solution to be filtered and the filtrate collected in the bottle. The paper and collected precipitate was washed in a separate vessel of water. The similarity of the process with that of Moore is most marked, and while Gooch's apparatus was introduced solely for laboratory use, there is no doubt that even in its original form it could be transferred into mill practice and give under certain conditions a high degree of economic efficiency. The Ridgeway filter also bears a marked resemblance to Gooch's apparatus. The first vacuum filter introduced to the notice of the mining world for the treatment of ore slimes was a belt machine patented in 1893 by W. Brunton. This belt passed over vacuum chambers, the pulp was spread over the chambers and the moisture was sucked through, leaving the pulp comparatively dry. By using several vacuum chambers the dry cake could be successively washed free from dissolved metallic and chemical values. The dry washed cake was cracked free from the cloth as it passed over the roller and was discharged. Machines of this type have been introduced, without any conspicuous success, into mill practice. Still it is by no means certain that a successful belt vacuum filter could not be built if taken up by competent mechanical engineers. One distinctive merit is offered by the belt type of machine in that the work is always in full view and that the operator is not working in the dark as to what is going on, as when filtering in the deep immersed type of filter. It is also continuous in its operation, another distinct merit. Several paper-making machines are built on a similar system.. The next vacuum filter to be introduced was that of George Moore. In 1903 the Mercur mine, Utah, attempted to use a Moore plant, but after spending some $60,000 in experimentation it was discarded, although reluctantly, as the principle appeared to be good. John Dern's annual report to the Mercur stockholders gave the Moore machine credit for its possibilities. In the year following the Mercur failure two fairly successful Moore plants were erected at Bodie, Cal., and Terry, S.D. The more marked defects of the Mercur plant were eradicated and gradually in both cases the plants were made distinct commercial successes. The main trouble in the early Moore plants was with the cranes employed to handle the filter baskets. Many accidents and irregularities of operation were due to deficiencies in the cranes; jars and jerks would crack or throw off whole sections of cakes inducing defective washing. In 1904, when Charles Butters took up the question of treating the vast tonnage of tailings from the Comstock mills, some form of filter was imperatively needed. Noting the flaws in Moore's system, he did away with the crane and introduced a stationary filter basket, changing the pulp wash solution and water by means of centrifugal pumps. The development of the mechanical details, the introduction of regular cycles, the attention to many of the *minutiæ* of filter practice caused the rapid introduction of Butters' system into commercial work. After Moore and Butters many designs of vacuum filters were brought forward, but none made much headway with the exception of the Oliver revolving filter and the Ridgeway. Many men deserve credit for the perfection of modern vacuum filters besides the men after whom the various machines are named. There can be no doubt that the vacuum principle can be still further extended. Mechanically, there is much to be said for the vacuum filter, yet engineers might well keep an open mind as to the respective merits of the high pressure machines and those operated by vacuum pumps. Strictly speaking, they all work by pressure. The vacuum machine merely takes advantage of the elastic force of the atmosphere. Perhaps the most scientific classification of filters would be to terms presses *high pressure filters* and vacuum plants *low pressure filters.* The question will then largely resolve itself into which system will give the best commercial results, the high pressure of the presses or the low pressure of the vacuum machines. The end is not yet.

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* In *Mining Science.*

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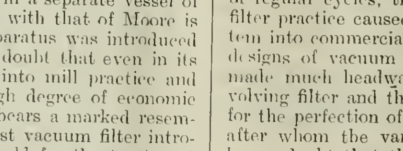

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Correspondence and Discussion.

The Length of Tube Mills.

To the Editor, *South African Mining Journal.*

Sir,—The article on "The Dimensions of Tube Mills" appearing in your issue of July 26th, states *inter alia*:—"In the past most of the tube mills—in fact all of the mills installed on Witwatersrand Mines—were 22 ft. long by 5 ft. 6 ins. diameter." The article further states that: "Apparently the Johannesburg Consolidated Investment Company has been the pioneer Rand firm in plumping solidly for a smaller size of tube mill." Both these statements are incorrect, as the following particulars relating to the tube mill plants of the General Mining and Finance Corporation will show. The first tube mill ordered by this group—which was the first or second mill installed on the Rand—was for the New Goch Gold Mines in July, 1903, and was 24 ft. long by 5 ft. diameter. As the result of observation on the working of this mill, the next two mills ordered in September, 1904, and April, 1905—for the Meyer and Charlton Gold Mining Co., Ltd.—were 16 ft. 5 ins. long; and the second mill ordered for the New Goch Gold Mines in May, 1905, was also 16 ft. 5 ins. long. A careful comparison of the results obtained from the 24 ft. mill and the 16 ft. 5 in. mill running side by side at the New Goch showed the principal difference to be a saving of about 35 per cent. in power in favour of the shorter mill, the product, both in quantity and grading being practically identical. The shorter mill was consequently adopted by this group at the end of 1905, and has been used in all plants subsequently equipped, so that of a total of twenty-six tube mills only one is over 16 ft. 5 in. long. The Consolidated Investment Company cannot therefore fairly be credited with being the pioneer of the shorter tube mill.—Yours, etc.,

E. FARRAR,
General Mining and Finance Corporation.

[This letter is dealt with elsewhere in this issue.—Ed.]

A New Water Spray.

To the Editor, *South African Mining Journal*.

Sir,—Having regard to the seriousness of the high death rate existing in the South African mines through phthisis, we have been experimenting in different ways to find some efficient method of overcoming this dreadful disease, and the outcome of our efforts is the "Briton" Water Spray for hammer drills. As you are no doubt much interested in the same question yourselves, we thought that it might interest you if we sent you some particulars of our invention. The enclosed pamphlets illustrate this device and show the difference in drilling with and without water spray. The way in which this has been taken up by the users of rock drills in this country and the highly favourable remarks made by many of the most eminent mining engineers in England go to show that we have hit upon the right idea, and that at last a really practicable water spray for use with hammer drills has been found. The invention is automatic and is very simple. The whole apparatus weighs only 2 lbs. and can be adjusted to any make of hammer drill. It draws its own water from a distance of 15 ft. and the extra air consumption taken up is hardly worth while mentioning. It is very clean to use and the way in which it kills the dust arising from a borehole while drilling is simply astonishing. We have not the slightest hesitation in saying that if our water spray was introduced to the Rand mines and adopted, it would be the means of successfully stamping out the present disease, which can only be avoided by such means as the use of an efficient dust allayer. We may say that the Cornish tin mines are adopting it, and, as you are probably aware, these mines are as much alike to the South African mines as possible, so far as general conditions go, and we should therefore say that our water spray is the very thing and should be considered by mine managers, etc., in Africa.—Yours, etc.,

W. MANNERING,
Manager, Bristol Engineering Co.

Bristol, July 10th, 1913.

Natal Coal Returns.

The following coal and labour returns for the Natal Province for June are compiled and furnished by the Mines Department:—

Colliery.	Output. Tons of 2,000 lbs.
Dundee Coal Co.	38,180
Natal Navigation	30,208
Utrecht	25,536
Hlobane	24,411
Durban Navigation	20,661
Elandslaagte	18,371
Glencoe (Natal)	17,141
Natal Cambrian	16,597
Ballengeich	12,474
South African	11,409
Hatting Spruit	9,027
Newcastle	6,867
Ramsay	5,476
Natal Steam	5,222
Wallsend (Natal)	3,154
Fairleigh	1,480
Dewar's Anthracite	540
S.A. (Vryheid) Coke	498
Avon Collieries	324
Star	166
Vaalbank	—
Totals	247,742
Corresponding month, 1912	220,098

Statement of coal bunkered and exported at Durban:—

	Tons. (2,000lb.)
Bunker coal	106,595
Bunker coal (overseas)	38,328
Coal exported to Union ports	29,895
Total	174,818

Booysens Estate.

The fourth ordinary general meeting of shareholders of Booysens Estate, Ltd., was held on Wednesday. Mr. F. D. P. Chaplin, M.L.A., presided, and there were also present Messrs. W. S. Smits, H. Johnson Hall, S. M. Nelson, M. Honnet, A. G. Gill, D. W. Rossiter, F. M. Cowan, and C. Hely Hutchinson, secretary, representing 23,938 shares out of an issue of 35,698. The chairman formally moved the adoption of the report and accounts, which was agreed to without discussion. Messrs. F. D. P. Chaplin and W. H. Dawe were re-elected directors, and Mr. Thomas Douglas was reappointed auditor.

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Rhodesian Section.

LATEST MINING NEWS.

Shamva Ore Reserves—The June Output—Eldorado—Susanna Mines—New Clifton—Globe and Phoenix—Rhodesia Railways Trust.

In his report for the year to 31st December, 1912, Mr. W. F. H. Dudgeon, local consulting engineer to the Shamva Mines, writes of the ore reserves of that company:—At January 1st these stood at 1,808,119 tons, of an average assay value of 4·62 dwts. At 31st December they stood at 2,263,312 tons, averaging 4·97 dwts. The following shows the tonnage produced per level, together with the average value:—Prospect level, 299,659 tons; average value, 3·77 dwts. First level, 738,853 tons; average value, 3·71 dwts. Second level, 787,607 tons; average value, 5·78 dwts. Third level, 440,193 tons; average value, 6·42 dwts. Total, 2,263,312 tons; average value, 4·97 dwts. The average value given in the above figures must not, of course, be confused with those given for the average value of the individual levels shown in the preceding schedule, these being derived from cross-cuts only, but tonnage values are calculated from the combined average values of the cross-cuts or winzes on the particular level and that immediately above it. Stoping operations have been continued during the year, and at the 1st January, 1913, the total amount of broken ore amounted to 155,413 tons, made up as follows:—From stopes, 130,313 tons, average value 4·37 dwts.; development, 23,400 tons; stripping, 1,700 tons; total, 155,413 tons. Owing to the difficulty of now storing the broken ore so that it can be easily and cheaply taken up again, stoping operations are being temporarily suspended, all the stopes being in such condition that they can be readily re-started at very short notice, the boys meanwhile being employed on similar work in excavations for the reduction plant.

* * * *

The total value of Southern Rhodesia's mineral output for the month of June has been officially declared at £254,426, as compared with £265,151 in May. The figures for the two months read as under:—

	May.	June.
Gold	£243,452	£240,303
Silver	1,529	1,358
Lead	604	498
Chrome Iron	8,364	5,679
Coal (Sales)	6,257	6,314
Diamonds	4,945	274
Total	£265,151	£254,426

May's declared output of diamonds included the production of several previous months, so that the falling away here (really £274 as against £810) is not so severe as at first sight appears. In any case the figures in this section of the industry must always be very variable, and are not necessarily a true index to the amount of work going forward on the fields at any given time. The latest reports from the Somabula areas are distinctly encouraging. The silver, lead, and coal outputs for the month show no great change, while the shipments of chrome iron, by this time a very firmly established business, show a gratifying increase. As to the gold return for June, the figures read: 56,990 ozs., valued at £240,323, as against 57,865 ozs. declared to be worth £242,452 in May—a drop of 875 ozs. in weight and of £2,149 in value.

* * * *

A cable from London received on the 17th inst., states that, according to the directors' report, the profit earned during the year ended 31st March last by the Eldorado Banket Gold Mining Company amounted to £120,112, and that the Board have declared a further interim dividend of three shillings per share.

Mail week advice as to the latest position at the Susanna is:—Winze 11 to 12 (north shute) has been sunk 6 ft. to a total depth of 47 ft. At 45 ft. reef not all exposed, still in hanging, 60 ins. wide assays 9 dwts. Eleventh level spur reef has been advanced 5 ft., to a total distance of 77 ft. At 75 ft. reef 51 ins. wide assays 5 dwts. Winze 10 to 11 (S.S.) has been advanced 6 ft., to a total depth of 24 ft. At 20 ft. reef 32 ins. wide, assays 15·6 dwts.

* * * *

At an extraordinary general meeting of the New Clifton Gold Mining and Development Company, Ltd., held in Salisbury on the 12th of July, the following extraordinary resolution was passed:—"That it has been proved to the satisfaction of this meeting that the company cannot—by reason of its liabilities—continue its business, and that the company be wound up voluntarily and that Mr. Edward Coxwell be appointed liquidator for the purpose of such winding-up."

* * * *

As the result of a rather acrimonious meeting in mail week, a committee was appointed to inquire into what is the proper remuneration to be paid to the directors of the Globe and Phoenix, to consider the position of the company, and to report to the shareholders accordingly. It is now announced that Mr. T. B. Reynolds, the chairman of the company, has resigned, and that his resignation has been accepted.

* * * *

Mr. Rochfort Maguire, presiding at a meeting of the Rhodesia Railway Trust on the 21st inst., said the directors proposed to assist the construction of branch lines in promising districts. He stated that better facilities were required at Beira to deal with the traffic; considerable expenditure would have to be undertaken there. He believed that by a policy of reducing the rates wherever there was a prospect of increased traffic they would secure the stability of their own position and promote the development of Rhodesia. The time had arrived when they could take more active steps to advance the prosperity of the railways than had hitherto been possible.

* * * *

The last report issued by the Transvaal and Rhodesian Company on the Fred Mine states:—Main Reef: 150 ft. level: Winze No. 12, situated 325 ft. west of main shaft, sunk to a depth of 17 ft.; average value, 1 oz. 1 dwt. over a width of 4 ft. 1 in. 250 ft. level: Main shaft sunk a further 46 ft. to a total depth of 331 ft. Winze No. 10, situated 60 ft. west from main shaft, sunk to a depth of 91 ft. average assay value, 1 oz. per ton over a stoping width of 30 ins. Winze No. 7, situated 200 ft. west of main shaft, sunk 100 ft. to a total depth of 350 ft. from surface. Drive east from this has been advanced to a length of 45 ft.; average value is 2 ozs. 12 dwts. per ton over a width of 2 ft. 11 ins. Drive west has been advanced to a total length of 50 ft.; average value is 2 ozs. 10 dwts. over a width of 3 ft. 3 ins.

* * * *

A report issued by the London and Rhodesian Mining and Land Company states:—Makaha claims: Radnor mine: Development for the month ended May 25—No. 1 shaft has been sunk a further 43 ft., total 204 ft. At 195 ft. cut mineralised quartz vein, assaying 10½ dwts. over 26 ins. North cross-cut to intercept main lode started at the 200 ft. level and advanced 5 ft.; expect to cut lode at about 25 ft. north. Winze 78 ft. west sunk a further 13 ft., total 49 ft., from 35 ft. to 45 ft., averaging 2 ozs. 10 dwts. over 58 ins.;

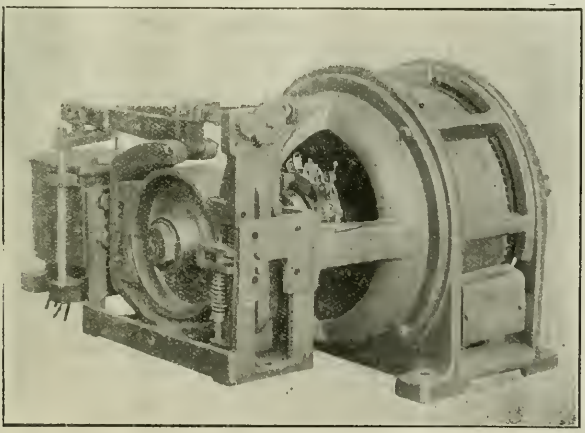
slower progress sinking winze caused through temporary difficulty with water; now erecting second hoist to cope with this and to facilitate work. Koodoo: Contract has been let and work commenced. Kelly's Option: East drive from No. 2 shaft extended 43 ft., total 73 ft., from 30 ft. to 65 ft., assaying 5¾ dwts. per ton over 19 ins. West drive extended 59 ft., total 93 ft., from 40 ft. to 75 ft., assaying 1 oz. per ton over 47 ins., from 80 ft. to 93 ft. assaying 3 dwts. 2 grs. per ton over 43 ins. Total length of ore so far opened up at this level 158 ft., averaging 11 dwts. over 57 ins. New Home: Shaft No. 3 cut reef at 24 ft. down, assaying 2 ozs. 10 dwts. over 8 ins. Nonpareil: The company has now obtained an option over the Nonpareil block of claims; these are situated between Koodoo and Kelly's claims, thereby completely consolidating the group of claims on this line of reef.

* * * *

It is understood that the Rezende Mines are shifting ten of the stamps from the Penhalonga mill and adding them to the ten stamps taken over from the last tributors of this property.

* * * *

At the meeting of the Shamva Company held in London in mail week it was stated that the directors hope to reach the crushing stage early next year, by which time there should be nearly four years' reserves in hand. It was stated last year that the company would require about £50,000 above its then resources in order to bring the mine to the producing stage, and it is now explained that owing to delays, the rise in the cost of machinery, the greater amount of development effected, and the necessity of providing for the instalment payable under the guarantee of the railway agreement, it will probably be necessary to find in all between £130,000 and £140,000 more capital. In the report the directors spoke of borrowing temporarily, but at the meeting it was said that they were considering if they should recommend an issue of reserve shares now, or at an early date. At the present time the company has 100,000 shares in reserve, and the number it will be necessary to issue obviously depends upon the price at which they can be placed. Assuming that the whole were issued, which would bring the capital up to £600,000, the directors believe that the distributable profits should amount to not less than 40 per cent. per annum. It is admitted that the ore-body at the 3rd level shows a contraction as compared with the level above, and though there is ground for hope that it is widening out again at the 4th level, the directors say that it will be some months before further information can be obtained, seeing "that no further development can economically take place there until the main adit reaches the reef, probably about November next." As to the future of the mine beyond the existing levels, Mr. Birkenruth stated that no reliable forecast could be given. "When the mine is fully equipped exploratory work will be proceeded with, so as to have indications as to the future as soon as possible." It appears that in March the Gold Fields Rhodesian Development Company, which is the largest shareholder, obtained permission for Messrs. Ackerman and Pickering to examine the Shamva property. The reports of these gentlemen, it is said, have in every respect confirmed the mine plans and the deductions which the directors have drawn from them, but apparently the directors are not at liberty to communicate the reports to the shareholders. Since the meeting it has been announced that the company have issued 100,000 reserve shares at £1 15s. to shareholders. It is announced that the Gold Fields of Rhodesia Development Company has guaranteed the issue free of commission.



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RHODESIA BROKEN HILL MINERALS.

Views of an American Authority—Rarity and Origin of the Minerals Discussed.

[BY GEORGE D. HUBBARD.]*

IN several issues of this journal space has been accorded descriptions of the rare minerals of Broken Hill in North-Western Rhodesia. A week or two ago we printed extracts from an article by Mr. A. E. V. Zeally on the geology and mineralogy of these curious mixed zinc-lead deposits. In the current issue of the *Engineering and Mining Journal*, of New York, there appears an account of these rare minerals from the pen of George D. Hubbard, of the Department of Geology, Oberlin College, Ohio, and as Mr. Hubbard has something of interest to say about the exceedingly limited distribution of these minerals and their origin, we quote him at some length. In the course of his article Mr. Hubbard writes:—

RARE MINERALS AMONG BONES

Among the less common minerals are the following: Smithsonite, a hydrous zinc carbonate, descloizite, a hydrous vanadate of lead and zinc, rare so far as other localities are concerned, but found here in large quantities. Tons of it were thrown on the dump before its nature and value were appreciated. It forma cavernous masses mixed with limonite. Vanadinite occurs in the muddy mixture of bones and clay in considerable quantities, and almost always on the more abundant mineral, hopeite, which will be mentioned later. Vanadinite is a light brown, more or less massive mineral in botryoidal masses and consists of lead vanadate and lead chloride. Pyromorphite is isomorphous with the last, *i.e.*, its composition is in accord with the same general formula but differs in one or more elements. It consists of lead phosphate and lead chloride, occurs with limonite, with tarbuttite, also referred to later, and less frequently with descloizite, and presents small prismatic, pale-green or yellow, six-sided crystals in masses or in loose aggregates. Hydrozincite is a hydrous zinc carbonate and occurs sparingly with the hemimorphite in white, opaque, earthy, masses or encrusting tarbuttite pseudomorphs after hemimorphite. Wad and possibly psilomelane, two earthy manganese oxides, occur with limonite and tarbuttite. Galena and sphalerite, the sulphides of lead and zinc, respectively, are found occasionally in the bone clay and may here be formed in place by the reducing action of the organic matter. All the secondary minerals mentioned above as well as those to follow have, most likely, been derived by alteration of these sulphides. But any such body of sulphides must lie at greater depths and is as yet unknown. Traces of copper have been found in a few of the minerals, but no mineral of that metal has yet been seen.

HOPEITE FORMERLY KNOWN IN BUT ONE PLACE.

Beside these more or less ordinary minerals, mentioned above, several otherwise rare, very interesting compounds are found here, and some of them in abundance and great perfection for minerals of such general rarity. The first of these is hopeite, a hydrous zinc phosphate formerly known in but one place, a zinc mine near Altenberg, Germany, where crystals were collected in 1820. None has been reported since, either from this locality or from elsewhere, until South Africa contributed its treasures. A little of the mineral was made artificially many years ago. In the Rhodesian kopje No. 1, nearly every specimen of the bone breccia is encrusted with hopeite in beautifully brilliant, water-clear crystals of all sizes up to about a centimeter in length. Some are single, some in showy clusters, and all associated with vanadinite. Quoting from L. J. Spencer's account of them in the *Mineralogical Magazine* for April, 1908, p. 5, "The hopeite crystals rest upon vanadinite or upon a thin yellowish-white crust which coats the surface of the bone breccia. This crust averages about ¼ mm. in thickness and usually consists of two layers, a lower one of finely fibrous hemimorphite, and an upper one of very minutely crystallized tarbuttite, hemimorphite, or calamine or of all three mixed together. On some specimens of this type the more distinct crystals of hopeite are associated with minute tufts of colourless needles of hopeite. Similar tufts of acicular hopeite were also found in some of the cavities of the bone breccia and inside bones of teeth. Other specimens, of a rather different type, consist wholly of a close aggregate of hopeite crystals with little or no matrix and no associated minerals. These masses of pure hopeite are of considerable size and may weigh several pounds." Optically, hopeite is of two dimorphous varieties arranged in the same crystal, in alternate laminæ. The two varieties, identical in composition, are distinguished as *A*-hopetite and *B*-hopetite. Its chemical formula may be written $Zn_3P_2O_8.4H_2O$. Parahopeite, a new mineral, occurs sparingly but more frequently than hopeite was known to occur until this Rhodesian deposit was found. Its composition is the same as hopeite but its sp.gr. is 3·31, while that of hopeite is 3·01. It crystallizes in the triclinic system, while hopeite is orthorhombic. It yields its water only at higher temperatures than hopeite, as follows:—

Degrees C.	113	139	163	201	233	Red Heat
Parahopeite ...	nil	nil	1·9	11·6	15·5	15·8% H_2O
Hopeite	1·6	9·2	10·1	10·6	13·5	16·2% H_2O

Tarbuttite is a second new mineral, known to science from this place only and named in *Nature*, 1907, p. 215, for the first time. It is found in great abundance, and large beautifully crystallized specimens are not rare. It occurs as an incrustation on limonite, or associated with descloizite or pyromorphite. It is found as a pseudomorph after descloizite, hemimorphite, smithsonite, also as an incrustation over bone breccia in two of the hills or kopjes. Tarbuttite is a basic zinc phosphate corresponding to the formula $4ZnO.P_2O_5.H_2O$ or $Zn_3P_2O8.Zn(OH)\frac{1}{2}$. This is the first basic zinc phosphate ever seen either natural or artificial. Crystals are brilliant and colourless to pale yellow, brown, red or green. The mineral is triclinic.

RARE MINERALS ACCOUNTED FOR BY PRESENCE OF BONES.

The occurrence of so many rather unusual minerals and especially the phosphates may be accounted for by the presence of the bones of the breccia. These bones are from various animals of which some 20 species have been differentiated. All are recent. They seem to have cacumulated in these caves, probably in part by the agency of man, at various intervals. And between periods of bone accumulation, clay and other débris gathered over them. Some cementation has taken place and the mass in parts nearly fills the entire cavity. Not all the minerals were formed at the same time. The hemimorphite or calamine and tarbuttite seem to have been the first to form over the bones and bone breccia; and then upon this incrustation came, the vanadinite, hylrozincite and more tarbuttite, and finally hopeite and parahopeite. The last two, and to some extent possibly the vanadinite are forming to-day. Phosphate-bearing solutions are depositing material derived from the first alterations, in tufts and groups of crystals of hopeite over all earlier crystals. Of course, all the minerals mentioned are of recent origin because they are found over bones of recent animals. The solutions now building the hydrous-phosphate crystals undoubtedly came through the bone breccia and there derived their phosphorus. Precipitation begins at once. In cavities in the bones and teeth, in cavities in the breccia; and over the outside of many bones, the beautiful newly formed crystals may be seen.

RARE MATERIALS MAY BE ENCOUNTERED ELSEWHERE.

While zinc and lead ore bodies are not usually associated with bone beds from which phosphates can so easily be built up, they do occur in limestones many times. And limestones often carry shells, bones, teeth, etc., which contain phosphates. Hence it would not be strange if phosphates of zinc and lead should be found in some other localities where they are yet unknown. Several phosphates of zinc not yet found in nature have been made in laboratories. Among them may be mentioned one anhydrous salt $Zn_3P_2O_8$ in rhombic prisms, and an acid hydrous phosphate $H_4Zn_2O_8.2H_2O$ in large triclinic crystals. These are distinct types from any of the phosphates yet found in nature. How long will it be until in some other locality some of the new Rhodesian minerals will be found? And how long until some of those possible, but never yet seen native, will come to light?

A cable from the Giant Mine reports the following results from No. 13 borehole, the location of the find being 750 ft. vertical below No. 7 level and 950 ft. east of the main shaft. This is the most easterly point so far reached by boring below No. 7 level. From 1,203 ft. in the borehole to 1,220 ft. the reef assays 1·4 dwts., and from 1,220 ft. to 1,225 ft. 2·4 dwts. These results are considered important. Dr. Corstorphine has had samples of the drill core under examination, and states that the enclosing series of rocks, component minerals, and general characteristics coincide with the higher levels of the mine, and there is, therefore, strong evidence for the belief that this is the lower portion of the faulted ore-body. The values are low, and Dr. Corstorphine suggests the probability of secondary enrichment having occurred in the upper portion of the ore-body after the faulting, but the company's engineers think there is reason for hoping that the ore-body has now been intersected in a poor portion, and that further boreholes laid out to cut the lode at some distance north and south have a reasonable chance of proving higher grade ore, and Dr. Corstorphine agrees that further boring should be carried out. If the results prove satisfactory the question of a new main shaft will have to be considered, and in the meantime, as a result of this development, the further sinking of the present main shaft will not be continued. Under these circumstances the board has decided to suspend the payment of dividends, and will husband the profits until the investigations are completed.

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RHODESIA'S MINERAL OUTPUT FOR JUNE.

The June Figures—A Decreased Gold Return.

The following is the official return, as supplied by the Rhodesia Chamber of Mines (Incorporated) of the mineral output for the month of June, 1913:—

MATABELELAND.

	No. of Stamps	Tons Treated	Yield. ozs.	Value. £
BULAWAYO DISTRICT—				
Abercorn 1 (W. J. Lane)	2	32	22.98	96
Agincourt (H. L. Midwell)	5	359	203.36	854
Alice and Atlas (Est. R. Barkley deceased)	10	459	48.74	205
Do. (tailings)	—	420	46.05	193
Anterior (W. J. Lane) tailings	—	180	26.50	111
Bangali (Hicks and Arbery)	5	112	39.21	165
Belmont (A. D. Hall)	5	175	69.27	291
Do. (tailings)	—	160	12.28	51
Big Ben (W. E. Hunt)	4	195	104.71	440
Do. (tailings)	—	132	63.30	266
Blanket (Forbes Rhod. Synd. Ltd.)	15	420	115.71	486
Bobs (Bobs Reef Syndicate)	5	310	52.98	222
Burton (S. H. Burns) tailings	—	450	19.09	80
Bushtick Mines, Ltd.	21 3T	6164	198.77	835
Do. (tailings)	—	3120	699.82	2939
Do. (slimes)	—	3140	277.92	1167
"C" (D. & C. Synd.)	10 1C	1844	87.43	367
Do. (tailings)	—	1510	181.53	775
Do. (slimes)	—	334	82.10	345
Carry (S. & G. Syndicate)	1 H	195	336.28	1412
Champion H. & 1 S. E. (R. Aserman)	5	514	135.52	569
Do. (tailings)	—	225	64.67	272
Claremont Mines (Rhod.), Ltd.	20	1539	134.46	565
Clean Up (H. W. Bearcroft)	5	430	157.95	663
Cottage (Cranleigh Synd.)	2	125	45.36	190
Do. (tailings)	—	270	22.12	93
Cross (T. W. Angus) tailings	—	300	37.79	159
Dam (W. H. Robinson)	2	106	27.08	114
Eagle A. (Macdonald & Co.)	5	551	255.35	1072
Do. (tailings)	—	270	39.13	164
Eagle 2 S.E. (J. Grant) tailings	—	—	2.93	12
Farvic (H. S. Henderson)	5	425	249.21	1047
Do. (tailings)	—	215	17.22	72
Florence (J. McC. McCrie)	5	25	8.00	34
Fred (Transvaal & Rhod. Est., Ltd.)	5	612	449.51	1888
Glen A. (A. Fraser)	3	216	44.68	185
Golden Butterfly (Wheeler, Davis and Rinton)	5	440	183.61	771
Godwin B. (Barrett & Stacey)	5	160	50.87	214
Good Hope (O. Norman) tailings	—	250	9.91	42
Imani (E. Rochfort)	2	210	34.18	144
IXL (J. Jose) tailings	—	650	22.34	94
Jumpers (Newton, McCay & Early)	5	260	277.58	1166
Do. (tailings)	—	150	50.61	213
Kameel (Rhod. M., Ltd.)	5	700	291.81	1226
Koba (Koba Syndicate)	5	150	25.34	106
Lina (W. J. Cooper)	4	75	39.45	166
Lone Hand (Armstrong, Furber and Alexander)	5	526	245.89	1033
Do. (tailings)	—	405	44.49	187
Lonely Reef G.M. Co., Ltd.	20 3T	5146	1344.78	5648
Do. (slimes)	—	5146	2860.31	12013
Mamba (J. M. Stone)	5	30	23.37	98
Master Cecil D.B. (E. Branson)	1 D	1	1.55	7
Matabele 3 (R. M. Nairn)	10	1314	614.59	2581
Do. (tailings)	—	720	113.20	475
Matabele Queens' Co., Ltd.	10	1550	259.11	1088
Do. (tailings)	—	1550	521.20	2189
Do. (slimes)	—	720	58.32	245
Nelly (F. D. Roscoe)	211	750	519.62	2182
Do. (tailings)	—	420	71.69	301
New Eclipse (J. R. Stewart)	5	660	218.02	916
Do. (tailings)	—	310	27.70	116
New Insimbi (P. J. Challen)	5	75	40.59	170
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	2062	781.17	3282
Do. (tailings)	—	1077	156.10	656
Olga (T. J. Montrose)	2	160	103.94	437
Peggy (E. H. Hambridge)	7	150	8.81	37
Princess (C. A. Abbott)	2	190	48.98	206
Rainbow D.B.S. (Nairn & Crewe)	5	160	34.10	143
Do. (tailings)	—	—	27.83	117
Red Rose (C. G. Bancroft) Concen.	—	60	17.87	75
Riversdale (Bruhns and Schwarz)	5	423	84.19	353
Riverside (R. Martindale)	2	20	8.71	37
Do. (tailings)	—	190	34.66	145
Roan (J. Robinson)	2	200	40.30	169
Sabi (Rhodesia Con., Ltd.) pannings	—	—	2.64	11
Susanna Mines, Ltd.	8	948	423.11	1777
Do. (tailings)	—	672	78.38	329
Do. (slimes)	—	814	58.79	247
Teutonic (Hanover G.M. Synd., Ltd.)	5	382	106.88	449
Tuff Nut (King's Synd.)	5	455	165.30	694
Do. (tailings)	—	300	49.08	206
Ubigubi A. 1 N.E. (T. Berwitz)	2	80	22.17	93
Umvoti (Henderson & Toshack)	2	170	37.96	159
Up to date (Cumings & Berry)	3	364	61.13	257
Do. (tailings)	—	271	44.35	186
Waimi (D. G. Otterson)	1 1R	8	20.00	84
Winifred (G. D Otterson)	1 1R	70	139.92	588
Worthless (Forward (R.) G.M. Co., Ltd.)	5	59	12.30	52
Xmas (M. Westerberg)	2	15	7.47	31
Bulawayo District Total			14,908.58	62,614
GWELO DISTRICT—				
Ardpatrick (C. Maleham)	3	338	166.17	699
Beacon Hill 1 (R. Aserman)	2	68	107.92	453
Bowie (A. Malcolm)	5	250	49.95	210
Broad Arrow (F. Ewing)	10	240	29.86	125
Bute (T. Pedlow)	5	80	17.93	75
Churchill (J. Jones)	6	60	58.31	245
Cinderella (P. Burt)	1E	310	63.71	268
Ssardas (Wolfshall Syndicate)	10	167	456.85	1919
Do. (tailings)	—	330	90.42	380
Do. (slimes)	—	137	14.52	61
Gaika G.M. Co., Ltd.	5 1C	2828	1042.45	4378
Do. (tailings)	—	1455	98.10	412
Do. (slimes)	—	1151	91.78	385
Do. (other sources)	—	—	86.24	356
Gartley (A. J. Grant)	2	50	37.67	158
Glenrosa No. 1 (H. G. McIntosh)	2	110	54.62	229
Do. (tailings)	—	77	20.83	87
Globe and Phoenix G.M. Co., Ltd.	40 10P	6150	7509.56	32168
Do. (concentrates)	—	336	835.25	3347
Do. (tailings)	—	3682	1045.88	4392
Do. (slimes)	—	2142	662.16	2803
Invulnerable (A. E. West)	5	157	42.29	178
Kings (P. S. Warden) tailings	—	520	131.91	554
Moss (James and Morrisby)	2	329	115.67	486
New Dunraven G.M., Ltd.	5	700	132.08	555
Do. (tailings)	—	700	52.84	222
New Moss (Robinson and Bennett)	2	195	124.39	522
New Trial, clean up (W. Cock)	—	—	2.54	11
North Bonsor (Cornish Syndicate)	10	1150	359.03	1508
Do. (tailings)	—	1085	140.98	592
Red Hill Dev. Synd., Ltd.	1C	2788	135.75	570
Do. (tailings)	—	1140	128.44	539
Selukwe Columbia G.M., Ltd.	1C 3P	3120	1113.08	4675
Do. (concentrates)	—	180	185.06	778
Do. (tailings)	—	2111	319.30	1341
Do. (slimes)	—	1000	108.17	454
Do. (other sources)	—	—	39.10	164
Shamrock (Crampin and Masters)	10	770	75.24	316
South Bonsor (Ideal Syndicate)	10	826	87.85	369
Do. (tailings)	—	960	42.20	177
Stator (C. C. Stack)	2	60	11.39	48
Tebekwe (A. N. Tyrrell)	10	332	78.87	331
Tebekwe 1 (A. N. Tyrrell)	5	428	157.74	663
Wanderer (Selukwe) G.M., Ltd.	4GR	11901	1192.45	5008
Gwelo District Total			17,316.88	73,211

Matabeleland Total ... 32,255.46 ozs.

Value ... £135,825

MASHONALAND.

	No. of Stamps	Tons Treated	Yield. ozs.	Value. £
HARTLEY DISTRICT—				
Acorn Gold Mines, Ltd.	5	430	89.92	378
Do. (tailings)	—	680	33.48	141
Agnes (P. S. Triggs)	5	477	219.34	921
Do. (tailings)	—	672	22.00	92
Alabama (Rix and Reynolds)	3	250	53.79	226
Battlefields (Rhodesia) Ltd. (Minaar and McArthur)	2C	1280	404.78	1700
Do. (tailings)	—	1024		
Do. (slimes)	—	256	156.87	659
Blue Rock (Blue Rock Syndicate)	2	280	69.14	290
Do. (tailings)	—	175	3.95	17
Brilliant (Mabel's Luck Syndicate)	7	720	353.10	1483
Do. (tailings)	—	352	129.56	544
Butterfly (F. W. G. Richards) tlgs.	—	1500	13.99	59
Cheshire Cat (Tavener and Arnold)	5 1P	498	259.08	1088
Do. (tailings)	—	350	74.71	314
Do. (slimes)	—	148		
Concession and W. Extension (C. E. Simpson)	5 1C 2P	2450	378.57	1590
Do. (tailings)	—	1800	109.76	461
Crown No. 2 (Crown Syndicate)	2	130	19.90	84
Do. (tailings)	—	110	20.97	88

	No. of Stamps.	Tone Treated.	Yield. ozs.	Value. £
Dalny 1W (Shagari Mines, Ltd.)...	4	400	33.24	140
Do. (tailings)	—	270	32.36	136
Dolly 1 (C. Tallon)	5	40	10.45	44
Dowry (P. A. Enke)	1 PN	168	22.41	94
Dreadnought (W. E. Masters)	1 C	424 .	45.69	192
Duke No. 1 (Jose and Munro)	5	145	38.81	163
Eiffel Blue & E. Ext. (Willoughbys)	10	1569	553.34	2324
Do. (tailings)	—	890	63.17	265
Enney Ext. (Ellsmoo & Goodyer) ...	5	90	23.16	97
Giant Mines of Rhodesia, Ltd.	30 2T	11462	3081.43	13088
Glasgow Mines, Ltd.	5	310	133.17	559
Do. (tailings)	—	300	63.00	265
Glencairn No. 3 (Glenrosa Synd.) ...	1	352	264.01	1109
Do. (tailings)	—	253	23.11	97
Globe (E. J. Davies) tailings	—	450	22.47	94
Golden Valley (J. Mack)...	10	588	156.21	656
Do. (tailings)	—	385	52.48	220
Grogram (Grogram Syndicate)	2	125	27.82	117
Guelph (J. and M. Davidson)	(5)	200	120.09	504
Inez (Harill and Smith)...	10	320	137.28	577
Juno (H. R. Nicholl)	5	315	43.08	181
Do. (tailings)	—	425	46.45	195
Kanyemba (Kanyemba Syndicate) ...	5	420	466.29	1958
(Do. (tailings)	—	191	69.98	294
Luke (Luke Syndicate) tailings	—	140	14.75	62
New Milky Way No. 3 (J. Mack)...	5	386	73.69	310
New Union Jack (S.A. Beach), tlgs.	—	170	24.66	104
Oleander G.M. Co., Ltd.	3	237	88.18	370
Do. (tailings)	—	107		
Do. (slimes)	—	130	31.69	116
Owl (A. Rolfe)	10	1360	487.79	2049
Do. (tailings)	—	890	158.20	664
Peacock (Wellington Mines, Ltd.)...	(5)	180	62.70	263
Pickstone Gold Mines, Ltd.	10	1249	589.53	2476
Do. (tailings)	—	511	109.43	460
Rouge 1N (Durrell and Morkel)— Other sources	—	—	1.17	5
Rosherville (Mrs. H. Tilbury)	1H	160	41.32	186
Rover (H. Coker)...	2	190	82.55	347
Seigneury (Cen. M. & In. Cor., Ltd.)	5	402	120.92	508
Do. (tailings)	—	345	21.79	91
Shepherds (Phoenician (Rhod.) Co., Ltd.)	5 1T	697	186.63	784
Do. (tailings)	—	490	82.11	340
Sid (Sebakwe & District Mines, Ltd.)	5	570	191.42	804
Do. (tailings)	—	930	93.65	393
Tea (Cent. M. & In. Corp., Ltd.)...	5	864	186.98	785
Do. (tailings)	—	456	61.66	259
Thistle-Etna G.M., Ltd.	1C	3383	903.67	3796
Do. (tailings)	—	2747	208.32	875
Do. (slimes)	—	572	40.41	169
Trinidad 1 (F. Maffiotti)	(5)	150	91.64	385
Try Me 2 (R. R. Aitkin)	5	325	146.94	617
Do. (tailings)	—	470	112.82	474
Washington (I. J. Minaar)	5	172	254.58	1069
Do. (tailings)	—	420	25.03	105
Do. (slimes)	—	250	12.04	51
What Cheer & Beroche (H. Moser)...	5 1H	1560	161.24	677
White Rose (J. Mack)	5	537	139.42	585
Do. (tailings)	—	210	30.70	129
Hartley District Total			12,789.04	53,842
LOMAGUNDI DISTRICT—				
Alluvial (R. G. Harding)	—	—	54.18	228
Eldorado Banket G.M. Co., Ltd.	20 2C 8P	7577	3286.17	13936
Do. (tailings)	—	7803	1081.06	4585
Linnell (A. R. Morkel)	2	635	171.76	721
Rex 1 (A. G. Hudson)	3	30	10.62	45
Ventura (Stone and Standen)	2	301	128.66	540
Lomagundi District Total			4,732.45	20.055
MAZOE DISTRICT.—				
Gadteara (P. R. R. Syndicate)	1D	17	11.95	50
Goth (Goth Syndicate)	2	130	77.37	325
Honest (G. Brown)	3	101	64.56	271
Jumbo G.M. Co., Ltd.	30	3300	596.05	2533
Do. (tailings)	—	2050	435.52	1851
Do. (slimes)	—	1250	116.34	495
Kimberley (Mash.) G.M. Co., Ltd.	6 2T	3400	380.94	1617
Do. (tailings)	—	1000	89.10	376
Do. (slimes)	—	2400	122.23	516
Mitre 8 (Bishop's Synd.)...	1D	15	15.99	67
New Found 1 N (D. H. Curry)... ...	5	492	207.24	871
Oceola G.M. Co., Ltd....	5	583	305.97	1285
Puff Adder (Puff Adder Synd.) ...	2	161	140.78	591
Tom Cat (Monarch (Tati) G.M. Syndicate).—clean up	—	—	10.79	45
Mazoe District Total			2,574.83	10.893
SALISBURY DISTRICT.—				
Bank (L. Chiappini)	2	350	95.38	401
Do. (tailings)	—	250	25.82	108
Hopefield (Hopefield Syndicate)... ...	2	230	54.20	228
Do. (tailings)	—	200	91.20	383
Inyague 3 (P. L. Peters)	2	102	49.44	208
Louise Grand (H. S. Plant)	1H	461	44.16	185
Do. (tailings)	—	461	72.75	306
Mont d'Or (Claxton and Russell) ...	2	188	160.18	673
New Full Back (New Full Back G.M. Syndicate)	2	268	57.25	240
Old Loyalty (Shamva Hen G.M. Co., Ltd.)	5	180	69.34	291
Virgin (J. Vorwerk) clean up	—	—	3.95	16
Salisbury District Total			723.67	3,039
UMTALI DISTRICT.—				
Cairndhu 2 W (E. K. Evans) slimes	—	100	9.52	40
Champion (J. Buchanan)	5	514	55.24	232
Do. (tailings)	—	210	23.59	99
Elgin (Umtali Waterfall Syndicate)	(10)	48	18.25	77
Do. (tailings)	—	217		
Do. (slimes)	—	151	42.90	180
Kent (E. Evans)	5	420	104.02	437
Do. (tailings)	—	160	19.09	80
King's Daughter D.B. (Umtali Waterfall Syndicate)	10	314	59.94	252
Do. (slimes)	—	933	99.26	417
Liverpool 38 (R. G. Snodgrass)	5	572	40.38	170
Do. (tailings)	—	200	11.00	46
Pilgrim 2 E (J. Meikle)	5	366	129.24	543
Quagga (Quagga Syndicate)	5	850	161.54	678
Rezende Mines, Ltd.	95	14811	1764.61	7487
Do. (concentrates)	—	161	626.49	2619
Do. (tailings)	—	2850	319.70	1356
Do. (under-declared value in May return)	—	—	—	1000
Two Sisters (F. E. Markham)	2	30	10.87	46
Umtali District Total			3,495.34	14,759
VICTORIA DISTRICT.—				
Grand Seam (Ledingham, Hart and Hart)	5	400	208.20	874
Kia Ora (Pickering and Shanahan)...	1D	13	11.12	47
Texas (G. Scott)	5	780	158.26	665
Do. (tailings)	—	725	72.49	304
Victoria District Total			450.07	1,890

MASHONALAND TOTAL	24,765.40 ozs.
VALUE	£104,478.
GRAND TOTAL GOLD OUTPUT	56,990.86 ozs.
VALUE	£240,303.

SUMMARY.

Gold.	ozs.	Value.
Matabeleland	32,225.46	£135,825
Mashonaland	24,765.40	104,478
Total	56,990.86	£240,303
Silver, ozs.	12.788.94	1,358
Lead, tons	30.91	498
Chrome Iron, tons	2,543.97	5,679
Diamonds, carats	48.62	274
Coal, tons	19,844.00	(Sales) 6,314
TOTAL VALUE OF JUNE OUTPUT		£254,426

Knights Deep.

The following official statement has been issued:—"Board of directors resolved on the 3rd June, under power received from the shareholders at the extraordinary general meeting held on the 24th January, 1913, to exercise the option to retain the Simmer and Jack East assets (other than cash assets), also to increase the capital by 93,526 shares to 743,526 shares, these new shares to be issued to the Consolidated Gold Fields of South Africa, Ltd., together with the 6,474 reserve shares, in full payment of their loan. Board of directors resolved further on the 24th June to allot the above 100,000 shares to the Consolidated Gold Fields of South Africa, Ltd., on the 8th July. The said shares will not, however, participate in the dividend payable to shareholders registered at the close of business on the 10th July."

The Mining Institute has moved into more commodious premises at St. James' Mansions, which will in future be Professor Yates' address.

THE WEEK IN THE SHAREMARKET.

"No Strike" Declaration Restores Confidence and Causes Immediate Reaction in Prices.

A sigh of relief went up from the market on Friday morning when the Trades Hall return to reason was signified. It is expected that recruiting for the mines will now be sanctioned by the Government; and the dislocation of industry caused by the strike brought to an end quickly. It has now to be admitted that the disorganization of work on the Rand during the month has been even more serious than it seemed, owing to the spirit of unrest and uneasiness among the men not permitting them to put forth their best efforts. That will all be changed now, however, and on those mines where native labour is not yet seriously depleted August should be almost a normal month. The improvement all along the line on Friday morning was very marked. Naturally, those stocks that had suffered most recovered most quickly, and all Rand stocks were substantially higher on balance. The lull in the Balkan trouble may also bring buying orders from the other side, and altogether the outlook is most cheerful. It is unnecessary to specify all the changed quotations; they are set out below, but enough popular counters, including diamond and tin shares, still remain at bargain levels and should go much better with the gradual recovery of its nerve by the market. In tins, Rooibergs and Zaaiplaats had considerable business. Among diamonds the favourites are still Frank Smiths and Crowns, good results from washing operations at the latter being anticipated.

According to the London papers, during strike week there diamonds were to some extent sympathetically affected; but there was no real weakness shown by the market leaders, such as De Beers and Premiers. Rhodesians were dull on some unfavourable developments. The unsatisfactory Gold Fields Rhodesia report gave the market rather a jar. The rumour that the company may have to reconstruct has, however, been denied. Publication of the Globe and Phoenix ore reserves, showing a marked decline in values, was another disturbing influence. Shamvas were offered, on further consideration of the difficulty which is likely to be experienced in financing the property up to the stage of production. Cam and Motors have been attacked, but there seems to be no reason for the suggestion that later developments have been disappointing. Chartered are still out of favour, but are obviously attractive at their present price, and should show a good recovery when the turn comes.

	Friday, 25th	Sat., 26th	Mon., 28th	Tues., 29th	Wed., 30th	Thurs., 31st
African Farms ..	13 6	13 0B	12 3	12 3B	12 3	13 6
Apex Mines ..	16 9B	17 0B	17 0S	13 6B	15 6	16 6B
Aurora West Uniteds	9 0S	—	—	—	—	—
Bantjes Consolidated	15 0B	16 6S	15 0S	12 9	—	14 6
Benoni Consolidated	—	2 6B	2 6	—	2 6B	2 9B
Brakpan Mines ..	57 6B	57 6B	55 0B	57 0B	56 0B	58 6B
Breyten Collieries	25 0B	—	—	—	—	25 0B
British S A . ..	—	19 0B	—	—	—	—
Bushveld Tins ..	0 4B	—	—	—	—	—
City & Subs (£4)...	40 9B	39 6	38 6	—	38 0B	40 0
City Deeps.. ..	52 6	51 0	50 0	48 3	47 0B	51 0
Cloverfield Mines ..	3 10B	3 9	3 3B	3 3B	3 4B	3 9B
Cons Langlaagtes	25 0	24 0B	22 6B	24 0S	23 0B	23 6B
Cons Main Reefs ..	15 0	15 0	—	14 3B	14 6B	15 0B
Cons Mine Select	—	—	—	—	8 0S	—
Coronation Freeholds	—	—	0 3B	0 4B	0 3B	0 3B
Crown Diamonds ..	9 0	8 6	8 0	7 6B	8 0	9 6
East Rand Centrals	7 9B	7 6B	7 6	7 3	7 0B	7 9B
East Rand Coals (2/6)	1 8B	—	1 6B	1 6B	1 8B	1 9B
East Rand Deeps ..	—	1 6B	1 0B	—	—	2 3S
East Rand Props...	47 6	46 6	45 0B	43 0B	45 0B	45 0B
East Rand Debs ...	£90S	£87½	£85B	£90S	—	—
Eastern Golds (/-)	1 3	1 3B	1 0B	—	—	—
Frank Smith Diam	9 3	9 0	8 3	7 9B	8 3	9 9
Geduld Props ..	19 9B	19 0B	—	18 6B	18 9	20 0
Glencoe (Natal) Colls	—	6 6B	7 3	—	6 6B	—
Glynn's Lydenburgs	16 6	16 6B	15 6B	15 6B	15 6B	15 6B
Government Areas	19 9	18 9	18 0	18 0	18 0	19 3
Hex River Expls	—	—	0 6	—	—	—
Jumpers	—	—	5 0S	—	3 0B	—
Jupiters	7 0S	6 0	—	5 6B	6 0S	6 0
Kaalfontein D (2/6)	—	—	—	—	—	0 3B
Klerksdorp Props	2 3B	2 3B	2 0B	—	2 0B	2 3B
Knight Centrals ..	8 3B	8 0	7 3	7 0B	7 0B	7 9B
Lace Props ..	2 6B	2 6B	2 3B	2 4	2 0B	2 6
Luipaardsvlei Est	—	—	7 0S	—	—	—
Lydenburg Gold Fms	3 0	2 9B	2 6B	—	—	2 9B
Main Reef Wests ..	8 0B	7 6B	7 0B	7 3B	7 0B	8 3B
Meyer & Charltons	—	—	—	—	100 0S	100 0S
Middlevlei Estates	—	1 0	0 10B	0 10	0 10B	0 11B
Modder B's.. ..	71 0B	—	66 0B	68 0	66 0B	68 6B
Modder Deeps ..	27 6B	28 0	26 0B	26 0	25 0B	26 6B
New Era Cons (5/-)	6 0B	6 0B	6 0B	6 0	6 0	6 0B
New Geduld Props	2 1	2 0B	2 0	1 9B	1 9B	1 10B
New Kleinfonteins	17 6	17 6S	—	15 0B	16 0B	16 3B
New Modders ..	215 0B	200 0B	200 0B	—	200 0B	—
New Unifieds ..	—	15 6S	—	—	13 6S	—
O F S & Trans D	1 6B	—	1 0B	1 9S	1 3B	1 4B
Potchefstroom Est	—	—	0 6B	—	—	—
Pretoria Cement Co	47 0B	47 0B	—	—	47 6S	47 0
Princess	—	—	4 0S	—	3 0B	3 6B
Rand Collieries ..	3 9S	3 9S	—	3 0S	—	2 6B
Rand Klips ..	1 3B	1 1B	1 0B	1 B	1 0B	1 4B
Rand Nucleus ..	2 0B	2 0B	1 9B	1 10B	1 10B	2 0B
Randfontein Deeps	2 0B	2 7B	2 7B	3 0	3 0B	3 0
Randfontein Estates	24 6B	24 0B	23 6B	23 6B	23 3B	24 0B
Roberts Victors ..	35 0S	—	25 0S	—	—	—
Rooiberg Minerals	27 6B	27 6	26 3	—	25 6	28 0
Roode Durban Deeps	—	—	—	25 9B	—	—
Shebas	4 9B	5 0	—	5 0S	4 6B	4 6B
Simmer Deeps ..	—	—	—	—	2	—
S.A. Breweries ..	39 B	38 6B	39 3B	39 B	39 B	38 1B
S.A. Lands ..	3 1B	3 0B	—	2 9B	2 9B	3 0
Springs Mines ..	14 6B	14 6	—	13 0B	—	15 0
Sub Nigels ..	10 6	10 0	8 0B	8 6B	9 0B	9 0B
Swaziland Tins ..	—	—	--	35 0B	35 0B	35 0B
Trans. Coal.Trusts	35 0	34 6B	33 0B	33 0B	32 0B	35 6
Trans. G.M. Estates			50 0S	49 0S	48 0B	48 0B
Van Ryn Deeps ..	28 6	27 9	26 6	26 3	26 6	28 3
Village Deeps ..	36 0B	35 0	35 0B	—	34 6	36 0B
West Rand Cons. ..		—	5 0B	6 0B	6 0B	—
West Rand Estates	—	—	2 6B	—	—	—
Witbank Collieries	42 6B	—	—	38 0B	—	—
Witwatersrands ..	61 6	—	56 0B	56 6B	57 6B	60 0
Wit Deeps ..	51 0B	48 6	46 0B	45 6	45 0	48 3
Wolhuters	13 0B	12 3B	12 0	11 0B	12 0B	12 9B
Worcester	—	—	—	—	40 0S	—
Zaaiplaats Tins ..	34 0	32 6	32 0	31 6B	31 6B	33 0

B Buyers. S Sellers.

On the 1st August next, the offices of the Belgian Consulate-General will be removed from 113, Derby Road to Cullinan Buildings, 89-90.

* * * *

Sir George Albu has returned to the Rand.

* * * *

Mr. Theo. Haddon, of the Globe and Phoenix, is on a visit to the Rand.

* * * *

Arland Ussher, the eldest son of Mr. Lancelot Ussher, has received the news that he has successfully passed the entrance examination for Charterhouse School, England. A. Ussher was sent to Park Town School in 1912 to be prepared for this examination, and the headmaster, Mr. A. R. Aspinall, and his staff are to be congratulated on the satisfactory result of their work.

S.A. Gold Trust.

The company's normal revenue from investments for the six months ending June 30, 1913, has been maintained, but in view of the continued market depreciation of so many of the company's assets, the directors do not feel justified at present in making any distribution on the ordinary shares of the company.

Engineering Notes and News.

Testing Rock Drills.

The manager of an ordinary small mine has neither time nor money to test thoroughly the drills he uses underground. He tries usually two or three of the best known makes and types and selects the one that shows most favourable results after a rather haphazard investigation. Previous experience may often guide him to a choice substantially correct, but in too many cases prejudice is allowed to outweigh obvious defects or advantages. Larger companies, in which the cost of drilling reaches a greater absolute figure, devote much attention to the machines used underground, and, in addition to a record of the performance of individual machines in the stopes and in the shops, engage in more or less exhaustive preliminary tests before buying any quantity of a certain make. The results of such tests are often as surprising as they are illuminating. The number and the range of the variables contributing to a machine drill's performance would open the eyes of the average superintendent. Probably no other American company pays more attention to this matter than does the New Jersey Zinc Company, at its Franklin Furnace mine. A series of tests begun here some six or seven years ago, and still in progress, has resulted in greatly increasing the efficiency of the company's drilling and in bringing out some curious points in the performance of rock drills, intelligible in some cases, and in others largely inexplicable. Every machine under consideration by the company is taken underground and its air consumption and drilling rate measured, this being done in a certain crosscut where the rock is uniform. The number of perforations in the back bears eloquent testimony to the extent of these tests. The holes are drilled for the most part vertically in calcite, since here, as elsewhere, experience is relegating the piston machine to a secondary position. The rate of drilling is naturally high and the absolute figures would not be instructive to a hard-rock miner. The comparative figures, however, among different makes and types of machines would prove most instructive if the company were willing to publish them. The air pressure used is between 95 and 100 lbs., and remains fairly constant for any one test. The temperature also is constant. Air consumption is measured by a system involving a pair of displacement tanks, similar to those described in the *Journal*, July 6, 1912. A certain number of displacements, corresponding to a certain amount of air, are run through, the time noted, and the number of inches drilled measured. The criterion on which the comparison of machines is made is a figure derived by dividing the number of inches drilled per minute by the air consumption per inch, thus taking into consideration both the speed and the air consumption. No machine is accepted for further trial unless it drills at least 7½in. per minute on 60 cubic feet of free air or less. A side light on the progress of drill design and manufacture is shown by the fact that for the machines of one manufacturer, the criterion mentioned has increased in some five years from about 0·2 to about 1·5, a remarkable difference. This test is, so to speak, only an elimination trial. The results are comparable to an engine indicator-card, taken to determine mechanical efficiency. The important factors of convenience, repair expense, retention of original efficiency under wear, steel breakage, etc., are determined by further tests in the harder formation of the stopes. If a drill is purchased, its probation is not yet over. All machines in use are numbered and a careful record is kept of their performance during their whole life. They are, in effect, on the mine pay roll, the number of shifts they work is credited to them and the repairs are charged. It would appear that after a few years of this, the New Jersey Zinc Company should know something about machine drills. One anomaly developed in the tests is the fact that a machine will often drill along as well or better with one wing of the cross bit broken off. More serious still are the contradictory results obtained with the same machine under apparently identical conditions. Thus a hole may be collared and a test run made; then, with no further change than a new piece of steel, a second run continuing the same hole may give a rate of drilling much higher. The calcite is too uniform to permit explaining this by a change in the rock quality. Mr. Catlin, however, suggests a very plausible theory. He conceives the blow of the hammer and anvil block on the steel to be transmitted through the latter as a wave. Such a wave will be reflected when the bit transmits it to the rock in the hole bottom and in its return may oppose or may coincide with the next blow of the hammer. When conditions are such that these rebounds reinforce the successive hammer blows, the maximum drilling effect is attained. If the rebund and new blow oppose each other exactly, then the drilling power is appreciably cut down. The usual conditions will be a varying degree of interference, giving varying results. An attempt to analyze and control the phenomenon, however, disclosed that too many variables existed, of which the chief are the length of the steel and its resiliency. That great variations of resiliency obtain is shown by dropping the same steel ball on different pieces of steel and noting the number and height of the rebounds. The differences developed are extensive. Evidently in the field of rock drills, drill steel, rock and their inter-relations, there are more things than our philosophers have yet dreamed of. Another anomaly concerns not the machine drills, but their manufacturers. One special machine was obtained for test from a certain manufacturer, which drilled at the enormously high speed of 32 inches per minute. No other results comparable to this were obtained. The machine was sent back to the factory and was never returned; nor could the company ever get a duplicate made.

Treatment for Electric Shock.

In a letter to the *Lancet* on the subject of electrical accidents, Dr. Reginald Morton, President, Section of Electrotherapeutics, Royal Society of Medicine, declares that there are only two fundamental facts that need be impressed upon the minds of everyone. The first is that death from electrical shock is only an apparent death at first; and, secondly, whatever the conditions or severity of the accident there is practically always a time, varying from a few minutes upwards, during which it is possible to resuscitate the victim by artificial respiration if resorted to at once. So important is it to commence artificial respiration quickly that it is the first duty of the bystander to see to this before everything else. He must not leave the victim to summon medical aid —it may be too late by the time the doctor arrives—but he should send for medical assistance if there is anyone else present. If the victim has fallen clear of electric contact, first-aid may be given at once; but if he remains in contact with the circuit the first step is to get him free. This is dangerous to the rescuer unless care is taken, but the necessary precautions are simple enough for any voltage likely to be encountered by the public—the highest being that used for railways and tramways, about 600 volts. If, then, the victim remains in contact with the circuit, his body must not be touched by his rescuer, but the latter may pull him out of contact by hauling on the clothing, or he may take off his own coat, insert his hands in the sleeves, and then handle the victim with little or no risk to himself. Almost any article of clothing or material may be used, provided it is dry and of moderate thickness. Artificial respiration must be persevered with for at least two hours, or until the patient revives. After return to consciousness complete rest is essential for a day or two. With the prompt application of first-aid, declares Dr. Morton, practically every victim can be revived, and of these nearly all will make a complete and permanent recovery provided they were previously in a normal state of health.

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COSTS, GRADE AND PROFITS IN JUNE.

Total Profit, £1,061,507—Recovery 27s. 6d. per ton.

THE following tabulation of the operations of the mines of the Transvaal contributing to the gold production is supplementary to the details published by the Chamber of Mines in its declaration on the 10th of the month:—

THE WITWATERSRAND.

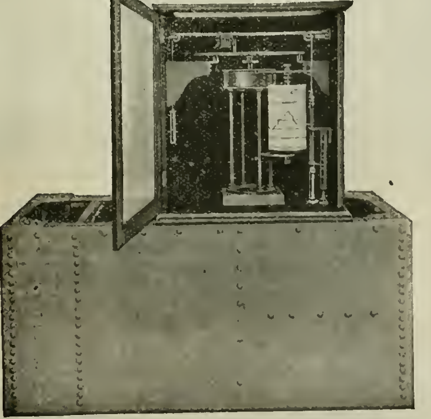
	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d.
1. Aurora West United ...	19,140	26	9	18	3	13,096	6,070	8	6
2. Bantjes Consolidated ...	36,764	24	6	21	0	31,208	4,916	3	4
3. Brakpan Mines	76,637	28	7	18	6	49,061	26,889	10	2
4. Cinderolla Cons.	14,107	33	8	31	7	13,027	1,349	3	3
5. City Deep	72,798	37	11	27	2	51,470	19,522	10	4
6 City and Suburban ...	50,387	38	9	21	3	27,605	22,535	17	4
7. Cons. Langlaagte	63,189	25	8	16	4	40.177	23,012	9	4
8. Cons. Main Reef	34,725	30	11	20	10	23,374	10,973	9	9
9. Crown Mines	285,566	30	7	16	9	156,346	126,081	13	6
10. Durban Roodepoort ...	15,016	21	8	15	10	10,958	4,059	5	10
11. Durban Rood. Deep ...	39,296	29	4	23	1	30,872	7,960	5	11
12. East Rand Proprietary.	254,643	29	5	18	10	159,170	88,817	10	6
13. Ferreira Deep	120,886	43	2	19	5	54,094	64,971	23	3
14. Geduld Proprietary ...	19,145	26	5	23	5	16,914	2,184	3	0
15. Geldenhuis Deep	83,230	29	6	23	4	65.849	16,477	5	10
16. Ginsberg	21,523	28	5	19	5	14,650	6,873	9	1
17. Glencairn Main Reef ...	15.878	14	4	12	8	13,295	2,584	2	6
18. Jumpers-cum-Treasury .	9,859	31	9	35	7	9,187	1,008	3	11
19. Jupiter	40,268	20	7	18	9	36,668	3,166	1	7
20. Knight Central	29,223	23	3	19	10	24,928	3,957	3	2
21. Knights Deep	75,495	15	0	11	0	55,363	19,364	3	10
22. Lancaster West	25	—		—		—	—	—	
23. Langlaagte Estate ...	58.827	20	1	16	0	44,395	14,814	5	8
24. Luipaardsvloi Estate ...	19,629	22	6	15	8	16,049	3,342	3	10
25. Main Reef West	29,513	30	7	18	8	22,402	6,776	7	0
26. May Consolidated	13,907	17	11	12	8	9,857	4,018	5	2
27. Meyer and Charlton ...	34,016	46	6	16	0	12,354	21,634	29	7
28. Modderfontein B. ...	71.944	40	10	14	3	27,681	43,474	24	8
29. New Goch	26,761	19	10	14	9	21,256	5,444	4	0
30. New Heriot	22,381	24	5	18	10	13,144	9,000	14	1
31. New Modderfontein ...	87,652	42	5	19	6	44,428	42,283	20	5
32. New Primroso	35,634	28	0	12	10	16.950	18,684	14	10
33. New Rietfontein	17,276	21	11	17	8	14,941	2,337	3	0
34. New Unified	15.700	25	1	15	9	10,665	5,033	8	2
35. Nourse Mines	76,710	30	9	18	6	54,492	21,376	8	7
36. Princess Estate	27,517	25	11	21	1	25,484	1,964	1	10
37. Randfontein Central ...	281,658	24	3	15	7	194,737	83,480	7	3
38. Robinson	102,472	34	2	13	7	41,216	59,716	20	0
39. Robinson Deep	80,647	27	6	14	0	45.677	34,017	11	7
40. Roodepoort United	25,682	20	0	14	11	21,675	4,014	3	1
41. Rose Deep ..	90,396	26	5	15	3	54,429	34,652	10	3
42. Simmer and Jack .	77,211	21	3	11	3	41,624	31,149	8	7
43. Simmer Deep ...	49,252	16	1	14	7	44,433	4,299	2	5
44. Spes Bona Tribute ...	5,921	19	0	—		—	—	—	
45. Van Ryn	38,841	31	5	18	11	23,439	16,055	13	0
46. Village Deep	74,165	31	11	20	7	47,940	25,367	10	11
47. Village Main Reef .	65,364	36	4	19	0	33.596	29,751	16	10
48. Vogelstruis Estate... ...	15,105	22	1	19	4	12,836	2.356	3	7
49. West Rand Central ...	3,504	31	6	30	10	3,100	406	4	0
50. West Rand Cons.... .	42,979	28	2	21	3	32,431	10,496	6	10
51. Witwatersrand ...	49,359	26	4	14	5	27,042	22.315	11	11
52. Wit. Deep	69,336	29	8	16	6	38,532	30,163	12	11
53. Wolhuter	37,694	25	5	18	3	26,884	10,329	7	0
Miscellaneous producers	17,651	—		—		—	—	—	
Witwatersrand totals	3,042,509	27	6	17	8	1920997	1061507	9	9
				51 cos.		51 cos.	51 cos.	51 cos.	

*Loss.

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by products.

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled.	
HEIDELBERG—									
1. Nigel	19,786	29	6	23	11	15 558	4,008	6	2
2. Sub Nigel	8,997	37	8	28	7	6,834	2.053	8	7
BARBERTON—									
3. Barrett	939	7	4	—		—	—	—	
4. Sheba	13,444	41	1	27	6	9,018	4,427	13	6
5. Sheba-Rosetta	956	17	7	—		—	—	—	
6. Worcester	5,607	18	1	12	1	3,750	1,824	5	11
KLERKSDORP—									
7. Quest	3,148	15	2	14	7	3,028	119	0	7
LYDENBURG—									
8. Ceylon Lydenburg ...	837	25	10	20	6	666	155	4	9
9. Glynn's Lydenburg ...	8,045	43	11	20	9	3,807	4,153	22	7
10. Transvaal G.M. Estates	45.960	61	10	20	10	15.159	29,317	40	4
Miscellaneous producers	23,158	—		—		—	—	—	
Total (outside districts)	130,873	37	2	21	7	57,820	46,056	17	2
				8 cos.		8 cos.	8 cos.	8 cos.	
Grand totals	3173382	27	9	17	9	1978817	1107563	9	11
				59 cos.		59 cos.	59 cos.	59 cos.	



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Finance, Commerce, and Industries.

Rhodesian Railways.

The Rhodesian Railways for the twelve months to September 30th last show a large growth in expenditure. In the gross revenue, which amounted to £1,000,830, there was an increase of £2,200, but as the expenditure was £37,934 greater, a decline of £35,734 appeared in the net earnings. The figures show increases of £7,882 in passenger receipts, £16,164 in minerals, and £2,107 in construction material, while there was a shrinkage of £23,663 in general goods. Mineral traffic showed an expansion of over 11 per cent. in the tonnage carried and of nearly 14 per cent. in the revenue earned. The financial position has improved, for the sum of £242,774 is written off the debit balance, reducing the total to £762,386. The gross revenue of the Beira-Salisbury section of the Mashonaland Railway Company for the same period amounted to £513,140, a decline of £42,384, and, as the expenditure advanced £33,709, the loss in the net receipts was £76,093. The decrease in the revenue was due to a falling off in general merchandise, a consequence of the drought in Rhodesia. Exceptional expenditure was incurred by the permanent way department, and the incraese in the total expenses was due principally to this cause. The net earnings of the Kalomo-Broken Hill Extension shrank £12,942, owing to a change in the character of the traffic carried.

* * * *

New Cape Central Railway.

The balance at credit of profit and loss account for 1912 is £45,753, comparing with £43,053 for 1911, the available total being £45,753, as against £43,144. The 4 per cent. interest on the Consolidated First Mortgage Debenture stock, the washaways account and the reserve account absorb £21,582, being £400 less than for the previous year, leaving a credit balance of £24,170, of which £19,125, being 4½ per cent. upon the Cumulative Income Debenture stock, will be applied in payment thereof in accordance with the trust deed, leaving £5,045 to go forward, as against £113 brought forward. The payment of 4½ per cent. on the Cumulative Income Debenture stock represents the balance of ½ per cent. due in respect of the year ended December 31st, 1911, and 4 per cent., being interest at the full rate, for the year ended December 31st, 1912. This entirely wipes off the arrears, 5 per cent. having been paid in the previous year. The satisfactory progress of the company has continued. There was an increase in the traffic receipts of £3,250 as compared with the previous year. The train mileage shows an increase from 206,424 miles in 1911 to 207,433 in 1912. The earnings per train mile were 9s. 3·60d., as compared with 8s. 10·67d. in the previous year; and the expenditure per train mile was 4s. 9·32d., as compared with 4s. 7·80d., leaving a profit of 4s. 6·28d. per mile, as compared with 4s. 2·87d. The 4 per cent. Cumulative Income bonds may be bought at about 78, at which price they may be regarded as attractive. The 4 per cent. First Mortgage Debenture stock may be bought at 90.

* * * *

Lourenco Marques: Its Economic Position.

In a very important paper read by Mr. J. H. von Hafe, Director of the Port and Railways of Lourenco Marques, last week at the meeting of Section A of the Scientific Congress, on the economic and general position of that town and port in relation to its trade and commercial connection with its hinterland of the Transvaal and Swaziland, and the north generally, he said, *inter alia:*—"The rivalry between South African ports in respect of the competitive area traffic brought about the Mozambique Convention, a treaty that provided for the division of the seaborne trade. It must, however, be admitted that the agreement has failed in achieving its purpose, and that the true interests of the hinterland commerce have not been well served. Competing routes, because much longer, have at least been responsible for a waste of time, fuel, wages, and depreciation of rolling stock, all caused by drawing the traffic from its natural course. It seems to me that a more rational scheme might be agreed upon. The Portuguese Administration, acknowledging the great benefits resulting from the international traffic passing through this port, might allow the Union a participation in such benefits whenever they exceeded a stipulated percentage over and above the net revenue of the Harbour and Railways of Lourenco Marques, providing that no preferential rates were to be established in favour of any of the rival ports. Such an agreement might take the form of a bonus granted to the Union, or be secured by means of a pool between all South African ports, after a mutual definition of the zones of influence or that radius of trade interests which should naturally fall to every port in this subcontinent. If such an agreement could be reached, I feel sure it would conduce to the abiding prosperity of both coast and hinterland, and raise the importance of the harbour of Lourenco Marques as a factor of wealth and for the development of its natural and extensive zone of influence."

* * * *

Commerce and Railway Matters.

The Railway Committee of the Capetown Chamber of Commerce has considered a number of matters relating to railway administration in connection with the forthcoming Congress of Chambers of Commerce of South Africa, and recommends that the following be placed upon the agenda in the name of that Chamber, viz.:—(1) That the Railway Administration should always be responsible for numerical shortages, except in the case of goods railed at sidings where no provision exists for checking, and should not have the right to make special contracts excluding responsibility for numerical shortages. (2) That goods may be consigned "to order," in which case delivery may only be made by the administration to the holder of the original railway receipt duly endorsed. (3) That inasmuch as provision is made that no person shall be entitled to a refund unless a claim is made by him within four months, it is reasonable that the administration shall not be able to claim under-charges after the expiration of four months. (4) That in case hay is loaded at a station, the administration should be obliged to ascertain the carrying capacity as provided for in regulations; and in case the weight declared by the sender, or ascertained by the administration, is less than the carrying capacity, it should be stated on the railway receipt that carriage will be charged on a definite weight, viz., carrying capacity. The committee further recommends that the following matters be tabled for discussion at the conference with the General Manager of Railways, to take place concurrently with the Congress of Chambers of Commerce, viz.:—(1) That in case a sender does not know the weight of goods he wishes to forward, and no facilities exist for weighing, and in consequence railway carriage is charged on the weight estimated by a servant of the administration, a refund shall be made by the administration at the destination if it is found that the weight has been over-estimated. (2) That weighbridges be erected at the principal country stations whence grain is railed. (3) That the railway rates on empty grain bags should be reduced at least to the level of those charged for agricultural implements and other requirements of the farming community.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME

His Majesty's Theatre: John Tiller Company	8.15
Standard:	See bills.
Empire	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9

The Extraction of Tin.

Mr. Arthur Richards, M.I.M.M., who demonstrated some years ago that the huge dump of tailings at the Carn Brea mine, Cornwall, could be profitably treated and is now managing director of the successful Cornwall Tailings Company, refers in his annual report to the directors of this undertaking to the chemical processes that have been devised for the extraction of tin from its ores. He considers that there are at least three, and possibly more, which are well worthy of a trial on a working scale. He writes:—" If either of these processes is successful in extracting, say, 95 per cent. of the tin contained in our dump tailings, at anything like a reasonable cost, say 10s. a ton, it will mean enormously enhanced profit. . . . That this extraction at this cost is quite possible I am convinced, but new processes usually take some time to perfect, so when we shall begin to benefit from them it is difficult to tell." By the method of wet concentration in vogue the Cornwall Tailings Company is only recovering 38 per cent. of the tin contents of its material, and experience has shown that owing to the refractory nature of the tailings it is hardly possible to improve the recovery by this method to even 50 per cent. except at a much higher cost.

Mine Manager Fined.

Mr. Edward Miles Sharp, manager of the New Modderfontein, was this week fined £50 on two counts for contravention of the Mining Regulations. It was alleged that he permitted the use of a cage of such a design and construction that the men using the same in a circular shaft were obliged to ride on top, endangering their safety. It was further stated that he failed to keep an entrance to a vertical shaft at No. 1 station fenced off by means of a barrier or gate. The prosecution arose out of the inquiry by the Mines Department into the accident last May, which resulted in two deaths.

New Cape Companies.

Weltevreden Ostrich Estates, Ltd.—Registered office, Ladismith. Directors: Guy Greville Wilson, Jacob Nochamson, Max Rose and Simon Brand. Capital, £200,000. Registered June 2nd.

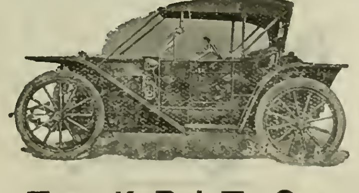
The Kitson (Cape) Lighting Co., Ltd.—Registered office, Capetown. Directors: Arthur Bostock and Joseph Newton Bird. Capital, £2,000. Registered June 12th.

River Bend Estates, Ltd.—Registered office, Capetown. Subscribers: Robert Frater, Matthew Henry Elliott, Magdalen Lillian Wilson, Ethel Mary Wilson, Harold Ewan Mossop, John Bennie Kayser and another. Capital £25,000. Registered, June 18th.

Neugebauer & Co., Ltd.—Registered office, Capetown. Directors: Max Theodor Neugebauer and James Bocock. Capital, £5,000. Registered, June 24th.

Maxwell & Earp, Ltd.—Registered office, Capetown. Directors: Edwin John Earp, Robert Miller Maxwell, Arthur Bostock, James Murison Stephen and Edward John Moore. Capital, £60,000. Registered, June 12th.

Kodak (South Africa), Ltd.—Registered office, 92 to 96 St. George's Street, Capetown. Directors: William S. Gifford, Francis Charles Mattison and Charles Edgar Barham. Capital, £10,000. Registered, June 26th.



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Douglas Grossmith Co., Ltd.—Registered [illegible] Capetown. D[illegible] Douglas Grossmith, Douglas A[illegible] S[illegible], William G[illegible] John Galvin. Capital, £5,000. Registered June 3[illegible]

Brunette Smith & Co., Ltd.—Registered office, Port Elizabeth. Directors: Cyril Brunette Smith and two others. Capital, £2[illegible] Registered, June 30th.

In Liquidation.

Afra, Limited, 195 Main Street, Johannesburg, tenders are invited for the purchase of the sweets manufacturing business [illegible] July 8th, by C. A. Russell, liquidator.

Groot Spelonken Trading Co., Ltd. (voluntary), June 27th, meeting on farm Middagzon No. 926, Zoutpansberg, P.O. Groot Spelonken, on July 15th. Isaac M. Kahn, liquidator.

Ulster Finance and Investment Co., Ltd., The liquidation account and plan of distribution, R.M., Johannesburg, for seven days from July 4th, and at the Master's office, Pretoria, for 14 days from July 15th.

Orpheum Theatre Co., Ltd., The voluntary [illegible] A.B.C. Chambers, Johannesburg on July 7th. T. Edgar [illegible] liquidator.

Georgian Gold Co., Ltd. (voluntary), June 19th, Henry J. Fitzpatrick, liquidator; meeting, 13 Winchester House, Loveday Street, Johannesburg, on July 9th.

De Pretoria Boeren Kooperatieve Vereeniging; claims to be filed with Altmann & Brugmann, Pretoria, on or before August 2nd. A. P. Brugman, liquidator.

Lyceum Theatres, Ltd.; duplicate list of contributories will lie for inspection at the office of the A.R.M., Johannesburg, and the Master's office, Pretoria, from July 4th to September 10th. Robert Hemphill, liquidator.

Hastie-Mazoe G.M. Co., Ltd.; a general meeting will be held at 5[illegible] Burgher Street, Krugersdorp, July 26th. A. J. Cotter, liquidator.

Potchefstroom Breweries, Ltd., Potchefstroom; a general meeting will be held on August 1st at the office of W. T. H. Frost, 1 Albany Chambers, Main Street, Johannesburg. F. M. Edwards, liquidator.

African Paints, Ltd.; list of contributories will lie for inspection at the office of the company, Kellner's Buildings, 79 St. Andrew's Street, Bloemfontein, and at the office of the liquidators, 43 London House, Loveday Street, Johannesburg. C. Crabb, I Pinder and C. H. Hirtzel, official liquidators.

Tenders Open.

CAPE PROVINCE.

For supply and delivery of electric bed lifts, New Hospital, Port Elizabeth (Sept. 10).

For supply and delivery of steel shelving, cabinets, pigeon holes, etc., Attorney-General's Department, New Law Courts, Capetown. In *Gazette*, 6th June. (Sept. 24).

For supply, delivery and erection of new power house, Uitenhage. In *Gazette*, 10th June. (July 29).

For supply of 4,600 tin plates and 4,600 enamelled mugs for Active Citizen Force, Capetown, and 2,600 plates and 2,600 mugs, Kingwilliamstown. In *Gazette*, 20th June. (July 16).

TRANSVAAL PROVINCE.

For erection of students' quarters, Rustenburg Tobacco Station (July 23).

For supply of 3,600 tin plates and 3,600 enamelled mugs for Active Citizen Force, Johannesburg (July 16).

For erection of Police Buildings, Trichardsfontein, near Trichards Station, District Bethal (July 30); for election of school and teachers' quarters, Elandsbosch No. 794, District Waterberg; the erection of two hostels, Emmasdale Reformatory, District Heidelberg (July 25).

For structural steel work, etc., New Brass Foundry, Pretoria (Aug. 12).

For stores, etc., to South African Railways (various). (Aug. 5, Aug. 19, Aug. 26 and Sept. 2).

ORANGE FREE STATE PROVINCE.

For supply, delivery and fixing in position, science fittings, Eunice School, Bloemfontein (July 29).

NATAL PROVINCE.

For additional coaling appliances, Bluff wharf, Durban (Aug. 1).

For erection of gymnasium, Pietermaritzburg College School: erection of new school, South Coast Junction, Natal (July 28).

Tenders Accepted.

For supply and delivery of a non-propelling floating, derricking crane, Table Bay Harbour, Orenstein-Arthur Koppel, Ltd., Johannesburg, on behalf of the Maschinenfabrik Augsburg-Nurnberg, at £27.451; for structural steelwork for coaling plants at Cato Ridge, Gilbert Hamer & Co., Durban, at £3.838; do., Hatting Spruit, J. & R. Niven, Johannesburg, at £2,906; for oils, Stanley Earle & Co., Ltd., Hull, Premier Extracting Mill, Ltd., Hull, Gringley & Co., Ltd., London, Bells Transvaal, Ltd., Johannesburg.

For erection of new signal tower and signalman's dwelling-house, Point, Durban, Mr. T. Poynton at £1,580, Durban; for erection of fencing, Alfred County Line, Port Shepstone to Paddock, Mr. W. J. Clothier at £7 10s. per mile, Port Shepstone; for erection of fencing, Weenen Branch Line, Estcourt to Weenen, Mr. S. H. Ashby at £7 per mile, Ladysmith.

For supply of covered wires to Department of Posts and Telegraphs, Western Electric Co., Johannesburg, and A.F.C. Electrical Co., Johannesburg.

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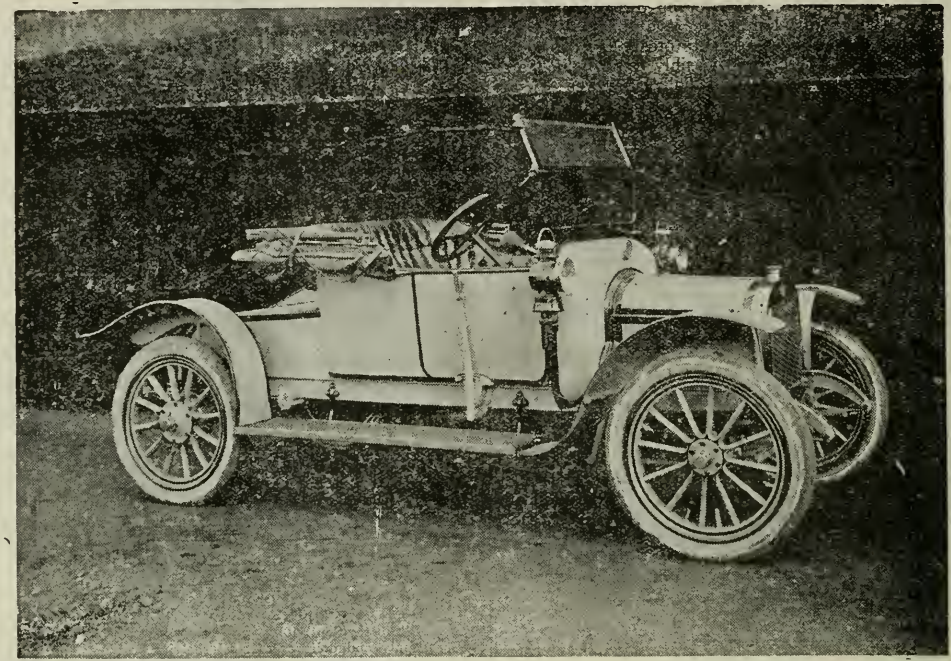

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Helpful Hints to Avoid Accidents.

1. (a) Before turning to the right hold out right arm and hand horizontally to the right; (b) Before turning to the left hold out the right arm and hand horizontally to the right, but with a forward sweeping action of the forearm and wrist; (c) When you are going to stop, hold up the right forearm and hand vertically, the upper part being horizontal; (d) On slowing down, hold out the right arm and hand horizontally to the right, but with a backward patting motion of the hand from the wrist. If properly and clearly done, there is no likelihood of this being mistaken for (b). 2. Get in the general habit of keeping to the left centre of the road. 3. When about to overtake, always sound a warning and see all is clear of oncoming traffic. Never attempt to force your way through to the detriment of anything meeting you. Never overtake on sharp curves or where you cannot see well ahead. 4. After overtaking, get well ahead before you incline again to the left; many drivers cut over too soon, forgetting that often the overtaken vehicle is travelling almost as fast as they are. 5. When an overtaking car sounds to warn that it wishes to pass, should there be obstacles ahead that prevent your giving it room, keep well out and make the slow down sign (d); if all clear, keep well to your left and make the sign (b), thus in either case showing that you hear it. 6. Approach main roads slowly with good control, sharp look out, and sound, keeping to your proper side and not cutting corners. Main road traffic has the right of way. This also applies to exits from drives. 7. If you have to stop on the road, draw in to the side as much as possible, and, before stopping, consider what spot is likely to be the least inconvenient to other traffic. 9. If backing for any distance, do so on that side of the road proper to the direction in which you are travelling backwards. 10. Endeavour to avoid puddles from which your wheels will splash passers-by.

Free State—Apostle of Equity.

Among the four Provinces the Free State stands out pre-eminently as the apostle of equitable treatment for the motorist, says "Motoring in South Africa." It is true that in so far as the Orange Free State ordinance differentiates between a motor bicycle and a bicycle with sidecar attached, and between these and a motor car, the phrase "registration fee" used in the ordinance is a misnomer. The cost of registering any one of these cannot be greater or less than in the case of any other, and therefore there are no substantial grounds of defence for a sliding scale of charges to meet the expense of administering a registration enactment. Not even the merciful principle of tempering the wind to the shorn lamb can be adopted in such circumstances. In this instance, however, the "lamb," as represented by the motor cyclist, is being asked to pay the maximum amount which is reasonable for a simple clerical service, and to a limited—a very limited—extent the Free State's "registration fee" must be considered as taxation. But this trifling fiction of the pivot Province may be pardoned to it for the candour of its confession that it has nothing by way of roads to offer the motorist in return for the taxation of his vehicle, and we may accept as perfectly sincere its avowed disinclination to take from him so long as the Province is not in a position to give value for money received.

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

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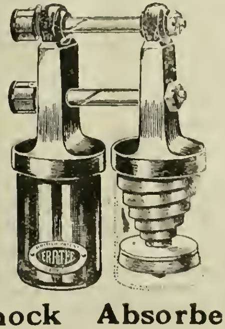
FOR MOTORISTS.



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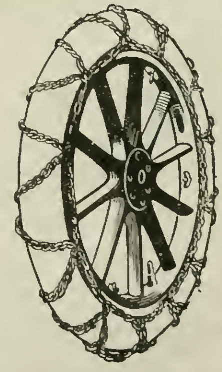

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MIDDLEVLEI ESTATE & GOLD MINING COMPANY, LIMITED.

(Incorporated in the Transvaal).

REPORT OF THE DIRECTORS

For the Year ended 30th June, 1913.

Submitted at the Ordinary General Meeting of Shareholders, held in the Board Room, Consolidated Gold Fields Buildings, Simmonds Street, Johannesburg, on Wednesday, the 30th day of July, 1913, at 11.30 o'clock in the forenoon.

Gentlemen,

Your Directors beg to submit their Report, together with the Accounts, for the year ended 30th June, 1913.

CAPITAL.

The capital of your Company, which is unaltered, is as follows:

Authorised	175,000 shares of £1 each	£175,000
Less	14,055 shares of £1 each forfeited .	14,055
Issued	160,945 shares of £1 each	£160,945

PROPERTY.

The area of your property remains unchanged, and comprises the freehold portion of farm Middlevlei No. 6, in the District of Krugersdorp, in extent 964 morgen 490 square roods, on which the Company owns two mijnpachts, in extent 132 morgen 424 square roods, equivalent to a claim area of 191·098 claims.

PLANTATIONS.

No sales of timber from the plantations have been made during the year under review.

ACCOUNTS.

The cash balance of the Company at 30th June, 1913, was £10,824 2s. 1d., of which £10,800 was on fixed deposit at 3½ per cent. per annum.

During the year your Company derived a nett revenue of £381 1s. 6d. from this source and carried a balance of £37 2s. 8d., representing excess of income over expenditure for the year, to Income and Expenditure Account, which at 30th June, 1913, showed a debit balance of £23,358 10s. 7d.

DIRECTORATE.

You will be asked to elect three Directors in the places of Messrs. F. D. P. Chaplin, M.L.A., D. Christopherson and W. S. Smits, who retire in terms of the Articles of Association, but are eligible and offer themselves for re-election.

AUDITOR.

You will also be asked to fix the remuneration for the past audit, and to appoint an Auditor for the ensuing year.

F. D. P. CHAPLIN (*Chairman*),
D. CHRISTOPHERSON,
W. S. SMITS,
Directors.

The Consolidated Gold Fields of South Africa, Limited,
Secretaries.
per C. HELY-HUTCHINSON.

Johannesburg, 17th July, 1913.

BALANCE SHEET at 30th JUNE, 1913.

Dr.			Cr.		
To Capital—			By Property (at cost, *less* sundry credits)... Freehold of portion of Farm Middlevlei No. 6, District Krugersdorp, in extent 964 morgen 490 square roods; Mining Rights over 132 morgen 424 square roods of this ground held under Mijnpacht Titles.		£123,835 0 0
Authorised 175,000 shares of £1 each..	£175,000 0 0		,, Buildings (at cost)		75 0 0
Less 14,055 shares of £1 each forfeited ..	14,055 0 0		,, Dam (at cost)		1,988 5 4
Issued 160,945 shares of £1 each ..		£160,945 0 0	,, Plantation (at cost, *less* sundry credits)		392 18 8
			,, Balance carried down		34,653 16 0
		£160,945 0 0			£160,945 0 0
To Balance brought down		£34,653 16 0	By Investments (at Book value)		£78 0 0
,, Sundry Creditors		3 0 0	,, Payments in Advance		61 19 7
			,, Sundry Debtors (Interest accrued on Fixed Deposits)		334 3 9
			,, Cash—		
			Fixed Deposits	£10,800 0 0	
			At Bankers, Johannesburg	24 2 1	10,824 2 1
			,, Income and Expenditure Account— Balance at 30th June, 1913		23,358 10 7
		£34,656 16 0			£34,656 16 0

The Consolidated Gold Fields of South Africa, Limited,
Secretaries.
per C. HELY-HUTCHINSON.

F. D. P. CHAPLIN (*Chairman*),
D. CHRISTOPHERSON,
W. S. SMITS,
Directors.

REPORT.

To the Shareholders,
Middlevlei Estate and Gold Mining Company, Limited.

I report that I have examined the above Balance Sheet with the Books and Vouchers of the Company for the year ended 30th June, 1913, and have obtained all the information and explanations I have required as Auditor. In my opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Company's affairs according to the best of my information and the explanations given to me and as shown by the books of the Company.

PERCIVAL WHITELEY
(Chartered Accountant),
Auditor.

Johannesburg, 16th July, 1913.

THE SOUTH AFRICAN
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WITH WHICH IS INCORPORATED
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Notes and News.

The Lot of the Worker.

All problems relating to white labour on the Witwatersrand are of such pressing importance at the present that it is reasonable for us to anticipate that a great deal of interest will be evinced in the series of articles which will be commenced in our next issue on the lot of the Rand mine employee. In these articles we shall attempt to describe the exact conditions under which workers along the Main Reef series labour, both above and below ground. The rates of pay prevailing at representative mines will be closely analysed for all branches of work. Moreover, we shall endeavour to set forth in detail the conditions under which employees live. Considerable space will be devoted to a description of the homes of the workers, both married and single, the means provided for recreation, the medical advice at the disposal of employees, accounts of the boarding houses, sick and benefit societies, and, in fact, every conceivable aspect of the lot of gold winners. The Rand mine employee is so much in the limelight at present that an honest and thorough attempt to set forth the truth about his life will doubtless be valued and appreciated, not only in South Africa, but in spheres of employment elsewhere as well.

* * * *

Phthisis.

The interim report of the Miners' Phthisis Prevention Committee, which has already been reviewed in our columns, was issued this week, and is printed in full elsewhere in this issue. Another important document received too late for this issue has been issued by the Chamber of Mines on the same subject. In the course of this statement it is shown that during the strike the matters of health conditions and miners' phthisis were never mentioned as a grievance. It is essential to bear these facts in mind, because the Federation leaders are now exploiting this disease to enlist sympathy, to cover up their declared causes of quarrel, and to divert attention from the various demands they have since put forward. In view of the fact that the disease known as miners' phthisis has now been raised as a battle-cry, the Chamber proceeds to give particulars of the steps which have been taken to cope with it, and the results thus far secured. It quotes the opinion of Mr. Kotze, Government Mining Engineer, on the existing conditions on the mines as regards health at the present day. This affords the best refutation of the exaggerated and misleading statements that have been published in the press during the last few months. The mines have also spent large sums in installing extensive systems of underground ventilation, and also in laying on water throughout the underground workings. The facts quoted showed that so far from there having been any neglect on the part of the mining companies, every precaution recommended by competent authority has been taken at very heavy cost, and it may be safely asserted that to-day the risk to anyone taking up underground work is far less than it was a few years ago. In a future issue we hope to deal more fully with the important points raised by the Chamber.

* * * *

Katanga Activity.

According to the *Board of Trade Journal*, there were 181 applications for registration of claims in the Katanga (Congo State) during 1912, including 67 for tin, 35 for gold, 10 for gold, silver and platinum, 14 for copper, 12 for iron and manganese, 11 for iron and 7 for manganese: 51 applications were made by prospectors not acting on behalf of concessionary companies. Two concessions were granted in the course of the year for the exclusive right to search for minerals, the area thus granted in each case being 500,000 hectares. Each of the two concessionaires was given the right to deliminate from these areas an extent of 100,000 hectares. Alluvial tin areas which give fair promise of being of considerable value have been discovered in the low-lying district of Kiambi. The proximity of these areas to the River Lualaba offers reasonable means of transport though frequent handling will be required by that route in changes between water and rail.

Finding a Scapegoat.

Sir Abe Bailey has been blamed for depreciating Rhodesian gold mining shares. At the meeting of the Amalgamated Properties of Rhodesia recently, he told the story of a deputation that once waited upon Paul Kruger in Johannesburg because the markets were very bad. The deputation put all the blame upon him, and asked him to legislate in a manner so as to relieve the position. He said: "You remind me very much of when, as a young man, I was playing in front of a fire with a baboon, and when the baboon put his tail in the fire he turned and bit me." "I appear," Sir Abe continued, "to be blamed for everything. I was blamed a year ago because I had so many Amalgamated Properties that I could command the services of the directors, and now I see I am blamed for having sold them."

* * * *

New Jagersfontein Mining and Exploration.

The New Jagersfontein Co. has resolved to invite the holders of registered shares to convert their holdings into share warrants to bearer, the company agreeing to carry out such conversion free of expense to shareholders, provided the conversion is applied for not later than 30th August next, in which case the company will pay the English stamp duty on the share warrants to bearer issued in exchange for certificates received up to that date. Certificates should be sent in as soon as possible, but not later than 30th August, 1913.

* * * *

Phthisis on the Rand.

An interesting article in the *British Medical Journal*, commenting upon the report of the Johannesburg Medical Officer of Health, says:—"The report covers the period July 1, 1911, to June 30, 1912, and shows that the total deaths from all cases among the white population numbered 1,628. This represents a gross death-rate of 12·5 per 1,000 of population, and when corrected for age and sex distribution amounts only to 13·3. This figure, so far from suggesting that there can be any very active cause of death at work in the Rand, would seem to indicate that, so far as the white population is concerned Johannesburg and its neighbourhood must be unusually healthy, since its general death-rate is considerably lower than that of other great centres of population. In London, for instance, during the year 1911, the death-rate from all causes was equal to 15·0 per 1,000, in Glasgow to 17·7 per 1,000, in Dublin to 21·5 per 1,000, in Paris to 17·2 per 1,000, in Berlin to 15·6 per 1,000, and in Moscow to 27·2 per 1,000. Nor is a different impression left when the death-rates from various specific causes are examined. Thus the death-rate among the white population from all forms of tuberculosis was in the year in question 0·4 per 1,000, and the corresponding death-rate from rock-drillers' pneumonia, or, as it is more commonly called, from miners' phthisis, 0·54 per 1,000. For the purpose of bringing these rates into focus the death-rates from certain other diseases may be quoted: thus the death-rate from pneumonia was 1·2 per 1,000, that from diarrhoeal diseases 1·7 per 1,000, from heart disease 1 per 1,000, from cancer 0·4 per 1,000, and from influenza 0·2 per 1,000."

* * * *

Klerksdorp Props.

A circular has been issued to the shareholders of the Klerksdorp Proprietary Mines, Ltd., by Mr. D. Symons, soliciting proxies for the meeting to be held in Johannesburg on 15th August and 9th September. Mr. Symons says: "The original object of the company was the development of mining claims in the Klerksdorp district. To-day practically no ground is held: the company only invests its working capital. The company's assets on 24th April last were of a liquid and sound nature. Those assets, fully shown in the last balance sheet, were mostly dividend-paying. No dividend could, however, be paid to the shareholders, as the shrinkage of market quotations, common to all South African companies, absorbed all income, and allowance had to be made from time to time to face further depreciation. The late board during the past few years pursued a safe and prudent policy, being adverse to entering into business of a speculative nature. Subsequent events have proved to us the wisdom of this policy. Before the agitation started for a 'more progressive policy,' the late board had proposed—and it is on record in the minutes of the company—to distribute the assets, one reason being that the expenses of carrying on the company were out of proportion to its income. This policy they still advocate in the best interests of the shareholders, and it has the approval of some large shareholders in London." Mr. Symons says his views, shortly, are that all available cash should at once be distributed to shareholders, and that debentures and shareholdings should be realised at the first favourable opportunity, or a distribution be made *pro rata*.

* * * *

Springs Mines South Shaft Close to the Reef.

The next event of importance which may be anticipated in regard to the Further East Rand will be the striking of the reef in the south shaft of the Springs Mines property. It has been estimated that conglomerate will be cut in this vertical at a depth of about 3,685 or 3,690 feet, and at the moment of writing it is believed that the bottom of the shaft is within 25 or 30 feet of the ore body. At the end of June the shaft had been sunk to a depth of 3,524 feet. It may be recalled that a borehole intersected reef at a depth of 3,696 feet, the core assaying 11·5 dwts. over 38·5 ins.

* * * *

G.S.W.A. Diamond Industry.

"The year 1912 was an epoch-making year in the diamond industry," states a report on the trade of the Consular district of German South-West Africa, just issued. During the first six months of last year the operations were severely curtailed, owing to lack of labour and the pressure of taxation. There was also dissatisfaction with the manner in which the output was disposed of, which combined to depress the industry and to keep the output at a low level. A far-reaching reform was introduced in connection with taxation, a special Ordinance being issued on 30th December last. Altogether great strides have been made towards a final and rational solution of the special problems presented by the diamond industry in German South-West Africa. The producer had been given a large amount of satisfaction, while the Government, it is stated, would not lose in the long run, owing to the better adaptation of taxation. Up to August, 1912, the average production per mensem was between 60,000 and 70,000 carats per month. In September the output jumped up to 102,600 carats, and the monthly output has remained at over 100,000 carats ever since.

* * * *

The Eldorado Banket's Position.

The report of the Eldorado Banket Gold Mining Company, although it throws little fresh light upon developments at depth, contains some important information as to the ore reserve position. An appreciable decline in fully blocked out tonnage was expected, in view of the restriction of work occasioned by the repairs to the vertical shaft, and of the serious shortening of the reef at the lower levels, but the shortage thus arising has been accentuated by the caving in of some of the workings in the upper levels, as a result of which high-grade ore contained in the pillars will be entirely lost or lowered in value by mixing with barren schist. After allowance of 25 per cent. for non-recoverable ore, the reserves are placed at 74,800 tons, or half the tonnage reckoned upon twelve months ago. The value, at 16·4 dwts., is 1·3 dwts. higher. As 87,200 tons were mined during 1912-13, the reserves represent only ten months' supply, although as the mill grade is to be lowered they will last somewhat longer. With an increase in both yield and costs the working profit was £122,600, or 28s. 1d. per ton, as against £121,000, or 27s. 6d. per ton. In respect of the latter period, the depreciation allowance—£23,700—was charged to profit and loss; this time the item—£21,000—is debited to reserve. Thus the net profit figures at £120,100, in place of £93,000, and the carry forward is increased to £54,800. The actual cash surplus stands at £71,800, equal to 4s. 9d. per share. For the current six months the profit "is not likely to exceed £4,000 per month," as against the past average of £10,000 per month. At the end of the six months the poistion is to be reconsidered.

TOPICS OF THE WEEK.

COUNTING THE COST.

After the exciting events of the past five weeks, naturally the return to normal industrial conditions is slow. But progress in that direction is being accelerated daily, and the mining companies appear to have acted wisely, if heroically, in putting the direct strike expenditure against July profits and "cutting their loss." Thus, the details of output and profit-earning for the mines of the Main Reef series for July, as was only to be expected, show in practically every case substantial declines on the returns for June. It appears that a number of mines lost more than a week in running time. Other mines fared better, but the "downing" of tools by the miners right along the reef, together with unreplaced native labour wastage, had a very marked effect on tonnage milled. Naturally, outputs were curtailed, and it is hardly necessary to state that profits were affected to an even more serious degree than revenue. The majority of the mining companies appear to have agreed to debit special expenditure in connection with the strike to the current month's revenue and cost accounts. We take it that these special expenditure accounts include not only insurance premiums, but extraordinary costs in respect of special constables, the guarding of explosives magazines, the erection of galvanised iron fencing, etc. Some mines incurred very heavy expenses under these heads. Thus the East Rand Proprietary Mines profit is subject to deduction of £19,754 on account of special strike expenditure, whilst the levy at the Crown Mines was £10,557. For the thirteen producing mines of the Central Mining group the total special expenditure in connection with the strike was just over £54,000. The mines of the Neumann group wrote off £12,271 under the same heading for the month. The Consolidated Gold Fields report for the month contains no reference to special strike expenditure, but the mines of this corporation, particularly the Knights Deep, suffered severely from the strike and attendant disorganisation. Apart from these losses to the shareholders in individual mines, there are the big all-round injuries to the industry, regarding the exact incidence of which only hypothetical estimates can be framed. Thus, only the labour recruiting people can say when the essential and inscrutable native will resume his normal rate of reflow towards the Rand, and, as usual, the people who know most are slowest to prophesy. Again, the concessions made by the mining companies to the men, now being rapidly translated into new "panic regulations" by the responsible Government officials must mean a certain direct curtailment of the white workers' effort, though whether that curtailment is or is not to be offset by heartier work on the part of those who benefit by it, remains to be seen. Similar uncertainty governs the effects of the other proposed reforms. These, it is satisfactory to note, are being proceeded with by the mining companies, despite the apathy of the men towards them, alleged by the labour leaders. White unemployment, caused directly by the inadequate native labour supply, is proving the most difficult problem of the mine managers at the moment. Here, perhaps, more than in regard to any other question, patience and understanding on the part of the men is now required. The leaders of the industry are as keen as anyone on working up to the pre-strike level of production, but they cannot be expected to do impossibilities, and time and the return of normal conditions are obviously essential to the replacement of all those affected by the recent dislocation of the industry. The latter—many of them among the most innocent participants in the trouble—should recognise that their worst enemies at this juncture are their so-called friends and leaders, whose glib daily utterances continue to frighten the nervous and weaken the confidence of those who supply the money to work the mines. For it seems to us that were the few irresponsibles among the agitators to be muzzled, public confidence would quickly be restored. The leaders who declare for early constitutional redress of all the workers' grievances—real and alleged—deserve nothing but sympathy. For the swashbucklers who shout about a strike at their followers' expense, we have no time. It would be folly to take them too seriously. Later on, when the country has had time to think and take stock of the situation, the workers may get all they require—by constitutional means, in spite, not because of, the extremists among their leaders. Meanwhile, nothing is to be gained by magnifying the issues of the recent rupture. After all, this country is merely experiencing—at a later date and in an aggravated form—the labour troubles from which no industry and no country have been wholly free of recent years. These troubles appear to be symptomatic of present-day industry rather than peculiar to the Rand. No mining field has escaped them—nothing but the fortunate lot of the working men here having delayed so long their appearance amongst us. If they be dealt with firmly and in the light of recent experience elsewhere, there is nothing to be feared from them. The exaggerations of self-seeking leaders must be opposed by the education of the men. The very appearance of hardship on the Rand, far more common than any real hardship, must be removed; and proper machinery provided for settling the petty disputes that play so frequently into the hands of unscrupulous fomentors of discord. If these things be done, if, in the words of Sir Lionel Phillips, "a little human kindness and cool thinking" be shown, the lessons of the last few weeks will not have been learned in vain, and the cost, wholly or in part, will doubtless be retrieved in the years to come.

THE LOCAL LOAN ISSUE.

In financial circles, the event of the week has been the calling of tenders by the Union Department of Finance for a local issue of Treasury stock. The whole of the issue of £6,000,000 is underwritten by the Public Debt Commissioners. The minimum price which will be accepted has been fixed at 98 per cent. for the three millions bearing interest at 3¾ per cent., and 100 per cent. for the other half, on which 4 per cent. is payable. The proceeds of the loan are to be applied mainly to the funding of an equivalent amount of floating debt in the hands of the Public Debt Commissioners. As the name, "Union of South Africa 3¾ and 4 per cent. Local Stock," implies, the present issue is purely local in character. Transfers and conversions can only be effected in Pretoria and Capetown, while interest will be payable half-yearly—on the 1st of January and the 1st of July—in South Africa. The loan is repayable in thirty years, 1953, but the Government retains the right to redeem at par on and after the 1st of July, 1933, on giving three months' notice. So much for the terms of the issue. When the idea of a local loan was first raised last year, this paper protested strongly against the step. It will be remembered that in a striking message to the London financial papers, some time ago, General Botha declared that the most pressing need of South Africa to-day was more capital, and evidence of the fact grows daily more overwhelming. Proof, were any needed, is furnished by some interesting banking figures printed by us last year, to which we would again direct attention. The figures for the whole of South Africa subsequent to 1909 revealed the fact that advances and discounts increased in a much greater ratio than deposits; that while the latter were slightly less than the figures for 1906, advances and discounts increased by about two and a half millions. Deposits exceed advances now by only £3,364,999—very little more than half the sum representing the margin in 1906. The margin is dangerously low, which fact seems to suggest that bankers have done their best during the last year or two to supply the increasing demand for accommodation, relying on an increase in deposits to support them in this purpose. Floating deposits do not show any tendency to swell, owing to the great demand for ready money in various branches of trade. The only alternative is, therefore, to tempt fixed deposits by means of high rates, but even this method has only proved partially successful, for the total is less now than it was in 1906. These facts point pretty clearly to the dearth of capital in this country at the present time. Several references were made to the matter in Parliament during the closing weeks of the last session; and one or two members urged the Government to refrain from its declared purpose of raising a loan locally, as such a method would prove harmful by diverting capital from channels where it is doing useful service now. It is clear that if the demand for accommodation continues to increase, banks will be unable to dole out supplies in the same liberal manner as formerly, unless deposits increase substantially. We may, therefore, be faced with another period of restriction.

In this connection, we may recall the significant remarks made in the course of his speech at the extraordinary general meeting of shareholders of the National Bank of South Africa, Ltd., by the chairman (the Hon. Hugh Crawford), who said, *inter alia*:—"In one of our leading newspapers an article appeared last week under the heading of 'Raising Capital in South Africa,' which, if given effect to by the Government in every respect, might be fraught with results contrary to what the writer imagined. Briefly, he advocated the raising of loans in South Africa, and increasing the rate of interest allowed by the Post Office Savings Bank, and removing the restrictions to much larger sums being deposited. Now, it is well known that the Government can borrow in the London market at lower rates than either banks, municipalities or private companies, and every loan so raised brings additional capital into the country. Were the Government to cease doing this, and to compete for deposits through the Post Office Savings Bank by increasing the rates of interest paid and removing or largely increasing the limit on amounts that could be deposited, the deposits with banks might be seriously reduced, and consequently the commercial community, mining companies, farmers and the public generally who are now supplied by the banks with funds, might have their facilities curtailed. As long as the banks can allow the rates of interest they are and have been paying, the Government should not be invited or urged to encroach upon business that legitimately belongs to banks and other trading concerns, more especially as such action is not to the benefit of the community as a whole.

As one alternative, we may recall attention to our suggestion, made last year, that Government should consider a proposal to retain in the country some of the enormous sums yearly sent out of it in the shape of insurance premiums. In financial, as in industrial matters, this paper endeavours to pursue a policy of moderate, constructive criticism, and it would be the last to suggest any interference with the free play of financial enterprise, were we not satisfied that the proposal is fraught with enormous benefit to the country, and is not directed against any outside interests in particular. Indeed, Canada, which is justly famed for its Imperialism and loyalty to the highest interests of the Mother Country, has set the example in this matter which, it seems to us, South Africa would do well to follow. Briefly, the Insurance Law in the Dominion lays down that every foreign insurance office doing business within its borders must invest in Canadian securities, and deposit those investments, to the extent of its actuarial liability towards policy-holders resident in Canada. The application of this law in South Africa would mean that for the £22,000,000, which is approximately the total insurance effected in this country with foreign companies, a sum of, say, £6,000,000, as actuarial estimate of the present reserve necessary to meet that liability, would have to be invested in the country. If we take the amount actually invested in South Africa to-day by the foreign insurance companies, including the deposits, under the Insurance Law, with the Government, as being, roughly, £1,000,000, we have £5,000,000 additional capital made available within the Union. In addition to this large sum, there would be further yearly amounts available on account of the annual premiums payable to foreign companies. The effect of these increases to the capital supplies of the country need not be laboured. It is evident that they would go far to meet the notorious dearth of funds available for mortgages, bank deposits, and the finance of trade which is only too likely to be accentuated by the new local loan issue.

For solving the problem of "raising the wind," the Union Government has, of course, other obvious alternatives. There is always the great undeveloped land asset of the State to be considered from several points of view. Thus, a tax on unimproved lands, or on unimproved land values, has many advocates; and the turning to direct practical account of the dormant State-owned millions of morgen is as popular a panacea for Treasury shortcomings as it is notoriously distasteful to the Government. Nor is the suggestion advanced in another part of this issue by a valued correspondent lightly to be dismissed. "Finance" puts in a very forcible plea for the adoption by the Union Government of the continental system of State lotteries, and he is not afraid to enter into a detailed account of the possible application of the system to, say, half the total amount of the present proposed Government issue. As regards the other three millions of the loan, he is content apparently that it should be dealt with according to more orthodox British methods. No doubt it will be objected against the suggested legalised State lottery that it will open the door to every other form of lottery, since the Government cannot consistently monopolise the privilege of raising money by this means, and deny it to others. But that is exactly what other Governments do, and are able to make out a good case for their action by insisting that absolute security and fairness are only guaranteed by State control. Indeed, we are far from being prepared—as our correspondent seems to expect us—to condemn his suggestion offhand. An excellent feature of the proposed scheme, it will be seen, is the fact that no part of the principal sum invested in these State bonds is ever in jeopardy. The gamble, as far as it goes, does not extend beyond drawing for varying shares of the annual interest, divided up into substantial and very attractive cash prizes. All the familiar and pharisaical objections against gambling will, of course, be levelled at the idea; and the notoriously speculative instincts of South Africa will be invoked as especially in danger of aggravation thereby. Nevertheless, our correspondent's letter seems worthy of serious thought, and the public would doubtless welcome some further information on what is generally conceded to be a fascinating phase of the public finance of other countries. Meanwhile, the Government has only its own precipitancy and maladroitness, as exemplified in regard to the present local loan issue, to blame for the turning of men's thoughts to novel and foreign ideas of public finance.

LATEST DEVELOPMENTS IN BRAKPAN MINES.

Excellent Disclosures—Highly Encouraging Values Over Substantial Width—The Effect of the Strike.

It is particularly satisfactory at a time like the present, when monthly profits and outputs evidence considerable contraction, to be able to record a marked improvement in July development in this portion of the mine gave an the Brakpan Mines. It has been common knowledge that for the first half of the current year reef exposures were disappointing, and this, in conjunction with a subsidence of the hanging wall, which resulted in interruption of work in five stope faces, adversely affected the profit and outlook of the company.

Recent Developments.

Latest development results in the main incline south and the 13th haulage level going west put, however, a distinctly more favourable complexion on the affairs of the Brakpan Mines Company. In the main incline reef of remarkable width and high value is being opened up. The July development in this portion of the mine gave an average assay value of 18·3 dwts. over 11·2 inches. The development results for the past few weeks are noteworthy. They have been as follows:—

Reef Width. Inches.		Assay Value. Dwts. per Ton.
51	....	7·2
+ 32	....	11·9
+ 31	....	26·2
+ 31	....	8·3
+ 28	....	29·7
+ 35	....	19·9
+ 46	....	17·1
+ 48	. ...	13·9
+ 19	....	16·3

A plus sign means that the full width of the reef has not yet been exposed, and it will be observed from the above that only in regard to the first sampling had the entire ore body been opened out. It is safe to say, then, the results stated above, satisfactory as they undoubtedly are, will be found to be even better after more work has been achieved. It should be remarked that the samples were taken 5 feet apart, so that the " run " of good ore disclosed by the above figures extended for about 50 feet.

On the Thirteenth.

The 13th haulage west is the second important point in the present underground workings of the mine. In the earlier part of the current year development here proved most disappointing. Indeed for a period of four or five months unpayable ore was exposed. Recently, however, an improvement in disclosures became noticeable. Whilst the quality of ore thus far opened on this level is nothing great, it is clear that there is justification for thinking that this level is getting into a good zone again. It looks, indeed, as if further development might prove the zone of good ore encountered on the 13th level west to extend with a south-easterly trend and establish the identity of this ore with that encountered in the south incline. It is hardly necessary to state that the location of a pay chute of considerable extent in the southern portion of the Brakpan property must prove an event of prime importance not only to the Brakpan Company but to adjacent propositions as well. Another section of the property which is looking distinctly better at the present is the upper eastern section of the mine. To the east of the dyke, which cuts through this portion of the property, it is estimated that there are standing developed about a quarter of a million tons of 9·5 dwts. value.

A Result of " Lay Out."

In considering the present position of the Brakpan property, it should be remembered that this mine has been laid out with two dip shafts, that is to say, a northern and a southern vertical and not with strike shafts east and west, as is common on the more central section of the Rand. It is easy to understand that with two dip shafts there is greater liability of all development faces being simultaneously in good ore or bad ore, as the case may be, than with shafts located along the strike. Hence an unduly good or unduly bad state and value of development may obtain for the time being. It would appear that last year's development at Brakpan was carried out in highly profitable chutes. The drives were advanced and comparatively poor ore was in turn encountered. Extension of these drives has again brought the development faces into excellent grade rock and there are reasons for believing that the good chute or chutes now encountered will not be of limited extent.

The July Results.

Brakpan, in common with all other mines along the Reef, and particularly large mines, has felt the effect of the " strike " severely. Milling was suspended from June 30th to the evening of July 9th, and the company had only 19 milling days. Slightly under 40,000 tons were crushed, and after debiting all expenses incurred in connection with the strike to current expenditure a profit of about £8,000 was earned as compared with £26,889 in June. The native labour complement of the company, which is normally 4,100 boys on a 160 stamp basis, has been reduced to 3,300. The effect of labour disorganisation is likely to be felt for some months, during which time a restriction of operations is in prospect, although to what extent is yet a matter of uncertainty. The 40 extra stamps which are in the first instance to be used as alternatives to tube mills, have arrived on the property, but construction work in connection with these has not yet been commenced.

Alleged Contravention of Diamond Act.

A sensational arrest has been made at Bloemhof by the police of the Diamond Department. A man, believed to be an ex-officer of the German Army, and his presumed partner on the Diggings, were arrested under the Diamond Trading Ordinance, on a charge of contravening section 4, by, it is alleged, selling diamonds not being the product of their registered claims, and being in possession of unregistered diamonds. It is alleged that about a thousand stones, weighing about one carat each, were found in the German's possession, and were confiscated by the police. The principal accused came from German South-West Africa recently, and erected an extensive diamond washing plant. He opened up a number of claims on the commonage, and his partner helped to wash up huge quantities of gravel.

Rooiberg Minerals Development Co.

The report on operations at the Rooiberg Minerals Development Company's property for the quarter ended June 30 shows that the profit declared was: April £7,770, May £6,802, June £5,233, making a total for the three months of £19,805. The reduction works treated 5,535 tons from the mine and 3,29t tons of sands and slimes were re-treated, from which 300 long tons of concentrates were produced. The accumulated tonnage of middlings and slimes not re-treated at the end of the quarter was 30,310 short tons of an average assay value of 2.5 per cent. metallic tin. Capital expenditure for the period was £1,039. At the mine the principal features for the quarter are:—High-grade ore has been exposed in No. 3 raise on the Union lode north, 210 ft. level, and also in No. 1a winze north on same lode, 110 ft. level. At the east end old workings an opening on the Empire lode to the south of the mine workings has exposed high-grade ore over a length of 120 ft. Decline in value of the pyritic and bond lodes. On exploration and prospecting work encouraging results are being obtained from the open trench on the extension of the Union lode to the south of the European hospital. At the intermediate workings, shaft No. 32 has been sunk on the intersection of two fissures, and ore of high grade has been disclosed. At the camp shaft and No. 15 trench, open workings, a quantity of high-grade ore has been exposed in the various fissures, which is sufficient to make the work done highly remunerative.

MR. G. A. TROYE ON THE FUTURE OF RAND MINING.

An "Independent" Estimate of Divisible Profit to be Earned.

THOSE of us who are familiar with Mr. G. A. Troye's views on the future of the Rand will not be surprised at the following extracts, which we print this week without comment from an article by him in the London *Mining Magazine*. *Inter alia*, Mr. Troye, as an "independent engineer," says:

"In estimating the divisible profits likely to be earned hereafter on the Rand, all doubtful factors have been eliminated. The problematical dividend-payers, namely, Jumpers, Main Reef West, New Goch, Luipaardsvlei, Princess Estates, Roodepoort United Main Reef, Simmer Deep, Vogelstruis Estates, and West Rand Consols have been treated as negligible. If no untoward conditions arise in 1913 the dividend earners should pay out £8,550,000. In 1915 some of the older contributors will be compelled to reduce their distribution. Against this, Geduld, Knight Central, Apex-Benoni, Cinderella Consolidated, Government Areas, Springs Mines, and Van Ryn Deep will gradually enter the list, and it is estimated that the year's result will exceed £8,400,000. Five years later, in 1920, the City and Suburban, Ginsberg, Glencairn, New Primrose, New Unified, Robinson, and Village Main Reef will either have ceased to exist, or be in their last stages. On the other hand, Apex-Benoni, Cinderella Consolidated, Geduld, Government Areas, Knight Central, Modder Deep, Springs Mines, and Van Ryn Deep should be in full swing. The dividends should approximate £6,000,000 in 1920. Again, five years later, at about 1925, several more of the old dividend-payers will have to be eliminated from the estimate, namely, East Rand Proprietary, Ferreira Deep, New Heriot, Rose Deep, Simmer and Jack, and possibly Van Ryn. The Modder Deep and new far east Rand companies will make some amends, but dividends will be reduced to about £5,500,000. In 1930 only seventeen of the present profit-earners will have survived, and their dividends will then total about £4,000,000, to which can be added, at least, £1,000,000 from Cinderella Consolidated, Geduld, Government Areas, Modder Deep, Springs Mines, Van Ryn Deep, and possibly Daggafontein and Cloverfield. In 1935 about sixteen companies will be in evidence; in 1940, about a dozen, among which the Cinderella Consolidated, Crown Mines, Geduld, the mines on Modderfontein, Randfontein Central, and possibly one or two new companies on the far East Rand may be expected still to produce a substantial amount of gold, but it is to be feared that the end will then be in sight.

"The foregoing forecast has been deduced from a carefully prepared schedule of all dividend-paying companies year by year, and the aggregates represent a fairly accurate statement of what may yet be expected from the Rand gold industry. The dividends will probably represent a fifth or less of the total output in the years to come, and the forecast indicates that a score of years hence some £25,000,000 may be expected from the mines annually. This means that the equivalent of hundreds of millions won from the earth will be put into circulation in South Africa, thus providing the means for expanding agricultural and industrial enterprise. Moreover, it is certain that base-metal mining will gradually begin to flourish, and will be directed from Johannesburg. Coal, iron, and notably tin, copper, as also nickel, are bound to become important factors. Of the last-named metal little is generally known here, but prospecting is now in progress on a deposit that looks quite as promising as Sudbury. Attention may be directed to the apparently drastic view expressed on the future prospects of the East Rand Proprietary. It should be borne in mind that development on the old Angelo Deep, as well as on the neighbouring Knight Central, Simmer East, Simmer Deep, and Jupiter, has consistently revealed abnormally decreasing richness of the orebody as greater depth has been attained. It is also apparent that the East Rand Proprietary will still owe a considerable debenture debt, exceeding one million sterling, when the four original outcrop mines are exhausted; it is to be feared that the position will show no great improvement on the expressed opinion, and the speculative factor will be no more valuable than in the parallel case of the Simmer Deep. In conclusion, it should be stated that the statistics are taken from the Chamber of Mines records, and are sometimes at variance with the companies' published reports. The discrepancies are, however, insignificant, and do not affect the general aspect. The accompanying statement gives the life of the principal mines and the share-values as on January 31, 1913. The denomination of the shares is £1, except where noted otherwise.

Mine.	Life. Years.	Share-value. Shillings.
Brakpan	30	80
City and Suburban (£4)	7	60
City Deep	30	64
Consolidated Langlaagte	18	42
Consolidated Main Reef	40	20
Crown Mines (10s.)	30	100
East Rand	5	30
Geldenhuis Deep	25	20
Ferreira Deep	7	60
Heriot	9	90
Meyer and Charlton	17	80
Modderfontein New (£4)	36	230
Nourse	18	33
Robinson (£5)	5	60
Robinson Deep	13	42
Rose Deep	11	49
Village Deep	18	25
Wolhuter	9	17

City Deep: Sale of Claims.

An extraordinary general meeting of shareholders in the City Deep, Limited, was held this week, Sir Lionel Phillips, M.L.A., presiding, to adopt a resolution to the effect that the provisional agreement, dated the 3rd of May, 1913, made between the directors of the City and Suburban Gold Mining and Estate Company, Limited, for the sale by the Company to the City and Suburban Company, Ltd., for the sum of £101,250 (i.e., £6,750 per claim) of the mining rights of a certain portion of the Company's mining ground, in area equal to fifteen claims, adjoining the more southerly part of the south-eastern boundary of the City and Suburban Company's property, and consisting of a defined area of ten claims and an additional area of five claims, the exact boundaries of which latter area are to be finally located in the manner described in the agreement, and for the granting of an option to purchase the mining rights of an additional area in extent 2.7 claims held under claim licences at the same price, i.e., £6,750 per claim, be sanctioned. Among those present were Messrs. H. Ryan, A. S. Pearse, H. C. Boyd, F. H. Barry, S. C. Steil, G. Callens and H. P. McCormick. Sir Lionel Phillips said that was a special meeting of the company called for the purpose of adopting or otherwise the provisional agreement entered into in respect of the sale of fifteen claims to the City and Suburban Gold Mining Company for £101,250, or at £6,750 per claim. There was a further clause in the agreement which provided that later the City and Suburban would have the right to purchase 2.7 more claims should they so decide, at the same rate per claim. The conditions of payment were set forth in the agreement, namely, £25,000 cash one week after ratification of the agreement by both companies, and the balance in four equal annual instalments, bearing interest at the rate of 5 per cent. per annum, the purchaser having the right to pay the whole sum or any portion of the balance at any time. The circular to shareholders and the reports of the consulting engineers, together with the plans, had been in the hands of shareholders for a considerable time, and in these documents would be found the reasons why the board desired to advise the shareholders to accept the agreement and ratify it. Generally speaking it was difficult in questions of this sort to decide with accuracy the value of the property to be bought and sold, for the reason that it was impossible to look into the ground. In the particular case, however, the surrounding workings in the City and Suburban Company's ground, in the City Deep, and also in the Village Deep gave them a very good indication of the value. Against this it must be said that the particular locality was admittedly disturbed a little by a fault which, on the one hand, was useful as forming a natural boundary to the City Deep ground, and, on the other hand, fixed the point where it was also desirable to form the boundary of the City and Suburban Company. So that from the working point of view the sale was desirable to both parties. The engineers had gone carefully into the value so far as it was possible, and he thought that the transaction was one that could be laid down as fair to the purchasing company and to themselves, as sellers, more particularly, so far as they were concerned, as it would be inconvenient ground to work and would have necessitated a good deal of dead work. Therefore, he moved that the resolution, as printed, be adopted and ratified. This was duly seconded, and unanimously agreed to, and the meeting then closed.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of July, 1913:—Tons crushed, 3,761, yielding 1,975 fine ozs.; estimated value of month's output, £8,295; estimated profit for the month, £1,270.

BOOKKEEPING.

A COMPETENT ACCOUNTANT, own office in Stock Exchange, has time for keeping one more set of books.

"G.," *Mining Journal*. Box 963.

RAND METALLURGICAL METHODS.

Local Talent Vindicated—Some Facts for Overseas Critics.

In two or three recent issues of this journal we have printed extracts from overseas critics of Rand mining and metallurgical methods. The views of gentlemen like Mr. Motherwell, of Australia, and Mr. Spicer, of America, the two other large gold producing continents of the world, have, we understand, attracted much local attention, and it is generally felt that their comments on Rand metallurgical methods are scarcely just. Briefly stated, most of these overseas critics, whilst applauding the general organization and magnitude of operations on the Witwatersrand, find fault with the metallurgical practice of the Main Reef series. One or two of them attack the methods pursued in mills and cyanide works on the ground that they are antiquated and conservative. Other technical visitors who have recorded their impressions appear to find fault with Witwatersrand metallurgists in that they have borrowed ideas from all other mining countries. On the face of it these statements seem contradictory to one another. If the argument that our equipments and devices are obsolete is tenable, then the view that the Rand is to be condemned because our technical experts have not been slow to appreciate the value of the ideas of other mining camps cannot very well be supported, for it obviously infers a denial of the first-named statement. The essential view which most of these critics seem to lose sight of is that the primary object of mining is the earning of profits for shareholders. The enunciation of this basic economic fact leads one on to a consideration of a number of logical corollaries. In the first place it should be recognised that progress in ore treatment means making more profits from the same grade of ore. It may or may not, however, involve (a) new processes or devices—a "different" method or device is not necessarily a " better " one; (b) a reduction in working cost; (c) higher percentage recovery. Critics who have machinery or processes to exploit consider that the employment of a new device or a new method is synonymous with progress. Often they do not take best results but those which favour their own purposes. Progress may involve the use of new devices or the employment of new methods, or it may consist in (a) better use of existing appliances; (b) economy through better arrangement of known devices; or (c) better organization of work. On the Rand all types of practice are represented, from those of the pre-war epoch to those of 1913, but no individual existing plant represents all known "best" practice. During the last few years there has been a large accumulation of knowledge requiring to be digested and profitably applied. Local conditions make many devices and methods unsuitable here, as, for instance, the large scale of operations precludes the " small handy machine " of limited capacity, just as a 3s. per day Kaffir may be more economic than a mechanical device with an 8s. per day white man. Another important consideration is that many devices have been tried locally and have been found wanting, which are claimed to work well elsewhere. The results of the successes only are made public: experience with failures is generally kept quiet for obvious reasons. Then, too, it must not be overlooked that the low average grade of ore and large sums of capital in plants and interests involved on the Rand preclude rash changes being recommended by those who are trustees for shareholders, and gambling merely in the name of progress with shareholders' money is a breach of faith. Notwithstanding all this, it must be admitted by all unprejudiced critics that Rand practice is good. At present banket is treated with a total residue at 0·3 dwt. at a total cost from shaft to dump of 3s. 2d. per ton. In fact, Rand practice of to-day represents combined efforts of many able men from every part of the world for a quarter of a century; the combined result of large capital and experimental expenditure. It is essentially a process of evolution and survival of the fittest. Note, too, that there is very little scrapped machinery, representing waste of shareholders' money on these fields. Gradual development has usually admitted of utilization of existing plant combined with its extension on more modern lines. Another important aspect of progress is this: At any time and on any mine there is an " economic limit " of extraction or residue beyond which it does not pay to go, since such extra gold costs more than it is worth. Other essential facts to remember are the simple nature of the Rand ore which does not require many appliances in use elsewhere. The large scale of operations makes organization of great importance, and the group system with specialist staff at the disposal of each mine gives these mines advantages single companies cannot afford. To sum up, we believe that in crushing practice, in stamp and tube milling and classification with limited supply of water the Rand is ahead of the rest of the world. When an appliance from abroad (*e.g.*, tube mill) which is suited for use here arrives it is promptly adopted and fully utilized. There are probably more tube mills in use on the Rand to-day than anywhere else in the world.

Stavoren Tin Mining Company.

Situated about sixty-five miles from Pietersburg by road, and on the Olifants River, lies the farm Stavoren No. 1871, of which the Stavoren Tin Mining Company, Ltd., are the owners. The farm is in extent 2,200 morgen, and, in common with several other farms in the locality, contains tin-bearing lodes. The company is composed of Pietersburg shareholders, and is at present working three different tin occurrences on the south-eastern portion of the farm, each of which is lying more or less parallel to the other. The present company has only been in possession of the property for the past twelve months, and the work which has been done by them has been accomplished during the last half-year. The syndicate, who were the original owners of the property, during their time did a good deal of prospecting, disclosing a number of payable pipes which have up to the present time not been worked by the Stavoren Company. The first consignment of tin only came to Pietersburg a week ago, and a second consignment arrived during the past week, and will be trucked at Pietersburg. It is said the company have now at grass tin ore to the value of £15,000. The directors of the company are Mr. H. Mentz, M.L.A., chairman; Mr. H. Selig, Mr. A. P. H. Fischer, Mr. A. McKechnie, Mr. A. van der Burg, and Mr. A. A. Auret, Johannesburg. Mr. H. McKay, of Pietersburg, is the secretary. The property is under the management of Mr. N. McWilliam.

Rand Native Commission.

The Minister for Native Affairs has appointed Mr. H. O. Buckle, Resident Magistrate, Johannesburg, as a Commissioner to investigate the conditions under which natives are engaged for and employed on the mines of the Witwatersrand, and if any grievances or abuses be found to exist to make recommendations with a view to the removal thereof; to inquire into the control capable of being exercised over natives housed in compounds in the Witwatersrand area and to make recommendations as to what measures should be taken with a view to safeguarding life and property in the event of any industrial or other unrest or disturbance.

Kolmanskop Diamonds.

The output of diamonds from this company's property at Luderitzbucht for the month of July was 9,215 carats. The effect of the recent heavy rains is still reflected in the output.

SOUTHERN AFRICA'S GOLD HARVEST FOR 1913.

Output Likely to Fall Below Original Expectations—Widespread Effect Probable—The Rand a World Industry.

In the recent industrial crisis on the Witwatersrand not only South African interests but finance the world over have awaited with the very greatest anxiety the outcome of the dispute between capital and labour.

A World Industry.

Our gold mines are not only the greatest assets of South Africa; they are the sources of supply of the metal on which all the methods of barter of the civilised earth are dependent for stable economy and enlightened exchange. The effect of gold output on the world's economic and social conditions is a fascinating study, and of late it has been given considerable space in the columns of this journal. Different authorities seem to hold widely divergent views on the effect the remarkable acceleration of gold production during the last quarter of a century has had on living conditions, on credit, wages and manufacturing costs, etc. But whatever the result it cannot be disputed that a gold field which produces about 40 per cent. of the entire output of the globe must be a most vital factor in finance, commerce and industry.

1912 and 1913 Returns.

For the first six months of the current year the mines of the Transvaal have produced gold of a total value of £19,711,256. Southern Rhodesia records an output worth £1,412,161 for the same period. The two countries, then, between them yielded gold worth £21,123,417 in the first half of the current year. Assuming this rate of production were continued for the final half, then the total output from South Africa (that is to say, from the Transvaal and Southern Rhodesia) would have an aggregate value of £42,246,834. We have before us no very reliable statistics as to the present rate of gold output for the world. But it is safe to say that an aggregate of forty-two and a quarter million pounds would represent getting on for one-half of the total return of the two hemispheres; at any rate, forty-five per cent. of that total return. Of this vast sum the Transvaal is responsible for the lion's share, and it goes without saying that of the Transvaal's total the Rand is responsible for by far and away the greatest amount. In order to visualise the statistical importance of the South African output figures, the following table which sets forth returns for both the Transvaal and Southern Rhodesia in 1912 and 1913 is given.

Transvaal—	
First six months, 1913	£19,711,256
Output for 1913 indicated by above	39,422,512
Output, 1912	38,757,560
Rhodesia—	
First six months, 1913	1,412,161
Output for 1913 indicated by above	2,824,322
Output, 1912	2,707,367
South Africa—	
First six months, 1913	21,123,417
Output for 1913 indicated by above	42,246,834
Output, 1912	41,464,927

Will the Rate of Output be Maintained?

That the rate of production which obtained for the first six months of the current year will be maintained for the rest of the year seems improbable. The continuity of productive work on the Rand has been rudely upset by the recent industrial unrest, and although the short-lived strike only affected the whole field for three days one or two mines on the Further East Rand were idle for a lengthier period. Moreover, the temporary cessation of native recruiting and the continued wastage of coloured labour are bound to have a detrimental effect on outputs for some considerable time to come. The advent of the Van Ryn Deep into the productive arena will act as a stop gap, but to a comparatively small degree only, and it seems as if the Rand's 1913 output will not exceed that of last year by the margin that was anticipated a month or two ago. In Rhodesia the rate of gold getting of the January to June period of this year is likely to be at least maintained. Indeed, one or two new producers will probably come into the list of milling mines. But in Rhodesia too it is unlikely that the 1913 gold harvest will be as large as has been anticipated, since two or three large mines which were expected to start crushing this year are for a variety of reasons not likely to drop stamps until early in 1914. Altogether, then, it appears highly probable that the total output of Southern Africa for the current twelve months will fall short of anticipations. There are no gold fields in other parts of the world which can be counted on to improve their outputs this year. On the contrary, it is believed that the 1913 outputs of several of the leading American and Australian fields will fall below the total declared in respect of 1912 operations. Gold production is discounted some considerable time before the actual shipment, some time before the actual raising of the ore in fact, and it is probable that recent industrial unrest in the southern portion of this continent will produce a very widespread effect. The Rand is a source of supply to which the whole world looks, and for this reason the production of the Transvaal for the month of July which will be announced by the Chamber of Mines either to-day or on Monday will be scrutinized with especial interest in banking and financial circles. At the time of writing such returns as have been published indicate a very material decrease for the month, although July had one more normal working day than June.

Geduld Proprietary Mines.

The quarter's profit of the Geduld was £8,021. The expenditure on capital account amounted to £31,661, which was expended on the enlargement of the plant and arrangements necessary in connection therewith. The funds for this purpose were provided for by the last issue of shares. For the three months ended 30th June, 1913, the footage sampled on the reef totalled 2,105, assaying 7·6 dwts. over 32·8 inches. The directors state: "The labour unrest on the East Rand affected your property on the 1st of the current month, when practically all employees were forced to come out on strike, and all work, except pumping and baling, was stopped. With the assistance of the staff and some men who refused to strike, the underground workings were kept dry. No damage of any kind was done. The strike occurred on the day on which the old surface plant was to be closed down to enable the readjustments necessary for starting up the new enlarged plant to be made. The commencement of this work was consequently delayed until the 9th inst. The new plant started work on the 16th inst., and is running satisfactorily. The mill was therefore hung up for 15 days."

May Consolidated.

The operations at the May Consolidated during the quarter resulted in a working profit of £12,065. The directors state: "At the beginning of the present month a general strike was declared by the workers of the Rand, which affected your property in company with all other mines, necessitating the closing down of all ordinary work from the 4th to the 6th instant, when the strike was settled. The mill was hung up for 3½ days. No damage whatever was done either to the surface works or underground. All work is now proceeding as usual."

THE POSITION IN THE KATANGA.

Business in Elizabethville Reported to be Stagnant—A New Gold Discovery—Fundamental Geological Features—Motor Transport.

A YEAR or two ago a number of Bulawayo commercial firms opened up agencies in Elizabethville in anticipation of a brisk business movement in the Katanga region of the Belgian Congo. It was thought that the continued development of the copper mines and commencement of smelting operations would result in marked commercial development. Unfortunately these expectations have not materialised, not in so far as Southern Rhodesian mercantile interests are concerned at any rate. A number of agencies have been closed down within the past few months, and it is understood that the British commercial houses remaining are in a very bad way. Business, it is understood, is virtually at a standstill for British firms, and it will take a long period of prosperity to reassure commercial men and induce them to again devote attention to the trade of the Southern Congo.

According to cables from Belgium, further evidence of the mineral wealth of the country has just been afforded. The Antwerp *Metropole* publishes an announcement that the Antwerp office of the Katanga Exploration Company learns that goldfields of considerable size have been discovered in the south of that Province, and that samples have produced one ounce to the ton. The question that will naturally occur to most people is whether the so-called "samples" are "samples" in the strict meaning of that werd, or whether they are specimens.

At the last meeting of the German Geological Society (June 1, 1913) Dr. Guillemain read a paper on the Geological Features of Katanga. His statements are based upon personal observations, especially in the southern part of the district, where he was for some time engaged as geological expert attached to an exploring party. Regarding ore deposits, he states that the copper ores may be divided into four different genetic types—magmatic eliminations in the granite and gabbro, lodes descending to great depth, syngenetical stratiform deposits in the Kundulunga strata. These three types are, however, of much less importance than the fourth, which is not only much more extensive in width and length, but also occurs more frequently. It represents a wide, cupriferous zone striking S.S.E.—N.N.W., corresponding to the so-called Lufira anticline direction. Dr. Guillemain believes that this type, too, is syngenetically stratiform, and has been subjected in later periods to strong metamorphic changes. Up to now, however, only the iron hat has been investigated, so that, as yet, no definite opinion can be given on this point. Gold and platinum, too, occur in the strata of the fourth type. In addition to copper, the tin ore deposits in Northern Katanga ought to be mentioned. They are contained in pegmatite lodes striking N.W.—S.E., and sometimes impregnated with sulphur and arsenic. The occurrence of diamonds has been proved, but it remains to be seen whether systematic mining for them will be payable.

A special measure of interest attaches itself to these opinions in view of the fact that Mr. F. E. Studt recently read a paper on the Geology of the Katanga and Northern Rhodesia before the Geological Society of South Africa.

Much is hoped from the commercial motor in developing the country in the near future. Roads suitable for this transport are being rapidly constructed, especially connecting Elizabethville with the surrounding country. At the end of 1913 some 1,500 kilometres of track will be finished suitable to loads of five tons.

THE MYSTERY OF THE FALCON MINES.

Further Light on Assay Discrepancies—A Hasty Valuation?—More Detailed Facts Now to Hand.

IT will be recalled that some weeks ago a sensation was caused in London by the reports that experts who had examined this copper-gold proposition were said to have arrived at assay values differing materially from the assay values given by the mine officials. Subsequently advice was received that the assayer employed by the experts had made a mistake. The question has caused considerable anxiety, and steps have been taken to secure a definite opinion as to true values.

A circular issued by the Company, dated July 16, gives a lengthy cabled report from the Bulawayo representative of the Company, Mr. J. G. McDonald, of the Gold Fields Rhodesian Development Company, the secretaries to the Falcon Company. Therein it is stated that on May 23 Messrs. Ackermann and Pickering had handed Mr. McDonald their report and declined to permit any delay in its presentation. The mine officials took their own assays, and subsequently sent two trained independent assayers to sample over the same points where samples had been taken for Messrs. Ackermann and Pickering. The assays of the samples thus taken were made by the Standard Bank of South Africa. The values as ascertained by the sampling of the two independent experts on behalf of the mine, those given by Messrs. Ackermann and Pickering, and the original mine assays are contrasted below :—

Position.	Width Sampled.	Values shown on Original Mine Plan.			Values given on Independent Resampling as shown by Cable.			Values given by Messrs. Ackermann & Pickering 224 Samples.		
	Feet.	£	s.	d.	£	s.	d.	£	s.	d.
No. 4 Level. No. 4 Cross-cut E. ...	85	4	5	0	3	12	7	2	16	9
No. 4 Level. No. 6 Cross-cut E....	80	2	13	0	2	5	0	1	11	7
No. 5 Level. Cross cut No. 9 Shaft	85	3	14	0	3	4	0	2	18	6
No. 5 Level. Cross-cut No. 1 E. ...	90	3	3	0	3	14	3	3	0	8
No. 5 Level. Cross-cut No. 2	70	3	4	0	3	9	0	2	12	8
No. 6 Level. Cross-cut No. 1 E. ...	90	3	0	0	2	9	9	2	2	6
No. 6 Level. Cross cut No. 2 E. ...	45	1	3	0	3	13	0	2	12	0
No. 6 Level. Cross-cut No. 1 W....	15	2	8	0	1	18	8	1	14	3
Taking total length of 560 feet represented by above cross-cuts, the respective averages would be		3	7	5	3	2	7	2	9	9

In the text of the cabled advice the following is set out :—
"We never could accept Ackermann and Pickering's sampling with confidence, owing to hasty manner in which it was carried out. Our two samplers, working at utmost pressure, took 21 days—their two, including both visits, took only 8½ days. Further, while Ackermann and Pickering were three days on the mine, only 14 hours were spent by them in investigating what is admitted one of the largest mines in Rhodesia—namely, 3 hours on April 29, 9 hours on April 30, 4 hours on May 2. . . . From all figures quoted, and in view of safeguards used in calculating ore reserves, A. J. Fraser is confident that the ore reserves and values claimed by us are substantially correct."

The circular concludes with the following :—"In view of the exhaustive checks that have been made by different engineers during the years that development has been in progress, and to which I referred in the circular sent you on 5th June last, the Board have always felt that it was improbable that the mine plans would be materially wrong, and the results given in the above cable show that their confidence is justified. Every effort is being made to hasten the delivery of the reduction plant."

TEMPORARY RESIDENT ENGINEER WANTED.

A Certificated Mechanical Engineer is required for a period of three (3) months from 25th August, to act during the absence on leave of the Mine Engineer. The Mine is situated in the Eastern Transvaal. Apply, stating salary required and enclosing copies of testimonials to—

"T. R. E.,"
c/o *S.A. Mining Journal*,
P.O. Box 963, Johannesburg.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Government £6,000,000 Loan.

To the Editor, *South African Mining Journal.*

Sir,—I have specially selected your paper as the medium in which to publish a few remarks and suggestions that have occurred to me with reference to this country raising a public loan of £6,000,000. I would like you to treat the matter seriously and not to merely hastily read my letter and then throw it into your waste-paper basket. The *S.A. Mining Journal* enjoys the reputation of being a serious business man's publication. One turns naturally to your columns for sound and reliable information on mining, finance and commerce, and for that reason I would like you to give some little thought to an idea and suggestion which may, at the first blush, shock a serious editor of a serious paper. In Great Britain and in all her Colonies the inhabitants have been brought up to think and believe that any State lottery is an immoral method of raising State loans. Now, when one comes to examine the Britisher, we find him moulded very much the same way as other people. It is also common knowledge that a very large percentage of the funds raised by State lotteries in other countries comes direct from Great Britain and her Colonies. This is proof enough that, although the Governments may protest against such methods of raising loans the inhabitants, *i.e.*, the English people, encourage it in other countries and rather like a flutter. I maintain it is not an immoral gamble any more than it is immoral to purchase gold, tin, copper or lead mining shares. Take for instance the German State lotteries conducted and supervised by the Imperial German Government, or the French, Austrian, Swedish and Belgium lotteries—none of these are considered immoral in those civilized and cultured countries, and why should not South Africa raise a loan in the same manner? The system adopted in raising money for the German municipal bonds is a very honest and moral businesslike way of getting a loan. The money is raised by means of bonds which are negotiable and redeemable after a certain number of years. *There is no gamble with the principal sum* deposited by the public, but the interest is raffled every six months amongst the coupon holders, *i.e.*, the people who put up the capital. Let us take as an example the amount the Union Parliament now wishes to raise in South Africa and then split this into two portions. A public loan of say £3,000,000 is required within the next six months. The Government applies to the public to take up coupons varying from £1 to any number the individual wishes to invest. These coupons are numbered consecutively, in a manner similar to that which the immaculate Britisher understands in sweeps and lotteries — a form of gamble he seems to be very fond of. Remember this, that the principal invested, in the coupon, is never lost or gambled with, but only the interest on the loan is put up to be drawn amongst the coupon holders every half-year. That is the only touch of gamble in the transaction, and this wets the appetite of those who fancy their luck, and for that reason the money is easily raised. Let us assume that the interest on the first loan of £3,000,000 is 3½ per cent. per annum. In order to cover the expenses the Government would be put to working the scheme, such as printing coupons, advertising and conducting the drawing under proper supervision, possibly personally superintended by the Treasurer or Auditor-General; the Government would take ½ per cent. and the balance at 3 per cent. on £3,000,000 would be £90,000. This amount is drawn, or raffled, or lotteried, as you wish to call it, every six months, thus on a certain date in the first half-year £45,000 would be distributed in prizes amongst the coupon holders. The amount would be cut up into prizes of varying amounts in the same manner as the German and other civilized and moral countries deal with their State loan, lotteries or bonds. For instance, the first prize drawn by a lucky coupon holder might amount to a very large sum and the whole might be distributed somewhat on these lines, say:—

1st prize	£15,000
2nd prize	7,500
3rd prize	2,500
10 prizes at £500 each	5,000
20 prizes at £200 each	4,000
100 prizes at £50 each	5,000
200 prizes at £10 each	2,000
800 prizes at £5 each	4,000
Total prizes, 1,133.	£45,000

Now, sir, I would ask you, as the editor of a financial paper, to tell me where there is anything of an immoral nature in this suggestion or anything that could possibly corrupt the inhabitants of this country if such a scheme were put into operation. By advertising the loan in other parts of the world the Government would find that people, less unctuous than South Africans and Britishers, would be only too pleased to take up the coupons, and I make bold to say that the bulk of the money would come from England. I trust that you will have the courage to bring this matter to the notice of the Prime Minister and the Cabinet, and, in more forcible language than I am able to command, ask them (the Ministry) to think seriously of starting a State bond or lottery on the lines indicated. The public in South Africa and people in other countries will soon enough put up the money and the scheme is not *ultra vires* in terms of the South Africa Act.—Yours, etc.,

FINANCE.

[This letter is dealt with in our leading columns.—Ed.]

Rand Native Labour Contract.

The *Official Gazette* of Lisbon, dated July 14, publishes a contract between the Portuguese Government and the Witwatersrand Native Labour Association of the Transvaal regarding the recruiting of natives in the Province of Mozambique for the mines on the Rand. The contract is to hold good until April 1, 1919.

MINING INSTITUTE.

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MINE MANAGER'S.
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Steam Pressure 70/80 lbs. per square inch.
Air Pressure, 70 lbs. per square inch.

Apply DARNGAVIL COAL CO., LTD.,
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PROGRESS OF MINERS' PHTHISIS PREVENTION.

Points from the Interim Report—Character and Measurement of Dust.

The interim report of the Miners' Phthisis Prevention Committee, dated June 13th, 1913, has the following, *inter alia*:—

On the 1st August, 1912, we presented to you a preliminary report which contained certain recommendations with regard to modifications of, and additions to, the existing Mining Regulations. Those recommendations had, as their object, the reduction of the amount of dust in mines, and it was suggested that they should not at first be given the force of law, but that they should be circulated and tried on the mines of the Witwatersrand. This report did not contain any account of the various experiments and investigations which the Committee has in hand, as they were not sufficiently advanced at that time to make it profitable to describe them. As the revision of the Mining Regulations, as a whole, was under consideration early in the current year, and as the modifications suggested on the 1st August, 1912, had been given a trial, the Committee felt itself in a position to recommend certain definite alterations and additions to the Regulations with the object of reducing the likelihood of underground workers contracting miners' phthisis. Consequently, on the 31st March, 1913, a communication was addressed to you embodying the recommendations of the Committee. It is now proposed to submit, for your information, a brief account of the investigations which the Committee has carried out, together with a summary of such information gained as seems to have a bearing on miners' phthisis. *Measurement of Dust in Air.*—The first point to which attention was devoted was the measurement of the amount of dust in mine air. Investigation has shown that the dust found in a miner's lungs is exceedingly small in size. The majority of the particles of it are 1 micron (.001 millimetre) or less in diameter, only an odd grain or two being as large as 10 microns. Consequently, it appeared of first importance, that all the fine dust should be caught and measured, whereas the estimation of the coarse dust was of little interest, and the latter was therefore eliminated in these experiments. The earlier methods employed for collecting and estimating dust were not sufficiently accurate, and the Committee, after considerable experimental work, have evolved an apparatus which collects the whole of the fine dust, but rejects the coarser particles, namely, those of 60 microns and upwards in diameter. On the whole, it may be said that whilst an apparatus has been evolved which is quite satisfatcory for experimental purposes, the Committee feels that there is still room for simple and convenient apparatus which could be used regularly on mines to ascertain the amount of dust in the air at various points. *Amount of Dust in Air.*—All the measurements of the Committee deal with mineral dust. No attempts have been made to estimate the amount of organic dust in air. In this report, all quantities are given in milligrams per cubic metre. (*a*) *Drives.*—When drilling in drives with machine drills, without water, certain measurements in 1903 on the Witwatersrand showed as much as 307 milligrams. The average of nine measurements in 1910 showed 170 milligrams (ranging from 61 to 530 milligrams). Experiments in Cornish mines showed an average of 460 milligrams.* It is, however, probable that all the above figures are vitiated by the fact that no precaution was taken to prevent the larger particles from getting into the filter tube. All the following determinations refer to fine dust only. In 1912, at the Jumpers Deep Mine, comparative experiments were made when dry drilling was being carried on, the sides of the drive being also dry, when an average of nine estimations showed 59 milligrams of fine dust. Another nine estimations, when drilling wet, and with the sides of the drive wet, gave 13 milligrams. Four other series of experiments (made chiefly at the City Deep Mine in 1912), where water was used, showed averages of from 4 milligrams to 8 milligrams of dust in the air. The Committee is quite satisfied that dust catchers are of little value in drilling; and that the only way to keep the atmosphere reasonably clear of floating dust is to prevent its formation by the abundant use of water delivered *into* the holes whilst being drilled. Immediately after blasting in a drive a sample taken 200 feet from the face gave 151 milligrams; and an experiment, where two sprays were installed, showed that the air contained 91 milligrams of dust after passing the sprays, in one hour after blasting the amount had become reduced to 8 milligrams, and in two hours to 2 milligrams. In another experiment, where a water-blast was used, two estimations, 30 minutes after blasting, gave 8 milligrams and 16 milligrams of dust in the air, respectively; one hour after blasting 6 milligrams were found. These experiments show that, although with the free use of water much the greater proportion of the dust is quickly laid, a certain amount remains in suspension in the air for a longer period. (*b*) *Stopes.*—The average amount of dust in stopes, whilst drilling was proceeding, varied from 4 to 6 milligrams. No measurements have yet been made with regard to the dust in stopes after blasting. (*c*) *Shovelling.*—An experiment was made in an engine chamber which was being cut underground, with a view to testing the effect of shovelling rock dry, as compared with shovelling it wet. When shovelling the rock dry, six measurements showed that there was an average of 18 milligrams of dust in the air; when shovelling the rock wet, three measurements each showed 2 milligrams of dust. It would seem, therefore, that the proper wetting of rock, before and during shovelling, is an efficient means of preventing the dissemination of dust by such operations. (*d*) *Return Air-ways and Upcasts.*—An interesting series of experiments was made at the Aurora West Mine, where the current of air downwards through a series of stopes to the 10th level, which serves as a return air-way. Two measurements of the dust in the return air-way, in the morning, gave 1.3 milligrams and 1.2 milligrams. In the air-way a water-blast, two sprays, and a water-door—that is, a door with wire gauze thoroughly wetted—were placed to see what amount of the must made in blasting could be laid by these devices. Numerous measurements were made, of which the following may be considered typical. Before the air reached the devices, immediately after blasting, the dust taken over a period of twenty-five minutes, proved to be 286 milligrams.† The air which passed the spraying devices, taken over three consecutive intervals of fifteen minutes each, contained 80 milligrams, 40 milligrams, and 36 milligrams of dust, respectively. Another series of experiments was made to see how quickly the dust abated after passing through the dust-laying devices. In the first five minutes, there were 164 milligrams of dust in the air, and in the second five minutes 84 milligrams; and then in four consecutive intervals of fifteen minutes each, the following amounts were obtained: 24 milligrams, 17 milligrams, 11 milligrams and 13 milligrams. The results obtained in these experiments are instructive. In the first place, they show how large an amount of dust may be present in mine air after general blasting. It may be that the amount was larger than is usual in other mines, which might have been due, in part, to the fact that the current passed downwards through the stopes. Secondly, the experiments show that water blasts, sprays and other devices, are powerless to eliminate entirely the dust from the air immediately after blasting. The most important inference is, that the currents of air in a mine, and the sequence of blasting, should be so arranged that men need not travel in—much less remain in—a return air-way, after blasting has taken place. An experiment made in 1912 at the Village Deep Mine, near the exhaust fan, by which the whole air circulating in the mine is drawn upwards, gave the following results:—Time, 2 p.m., 3.5 milligrams; 2.40 p.m., 1.0 milligrams (fan stopped part of the time); 3.15 p.m., 9 milligrams (smoke appeared at 3.35 p.m.); 4.40 p.m., 12.5 milligrams; 5.45 p.m., 9.0 milligrams; 6.10 p.m., 5.5 milligrams; 8.45 p.m., 3.0 milligrams. The effect of blasting on the amount of dust in the air is here clearly seen; but the amount of dust is very much less than in the case of the Aurora West return air-way. The amount of dust in the upcast of the Simmer Deep Mine was measured by Mr. McArthur Johnston at the top of the shaft, both before general spraying was installed underground and afterwards. The results are interesting:—

Time.	Sept., 1911. Without sprays. Milligrams. Total Dust. * Mineral.	April, 1912. With sprays, & wetting. Milligrams. Total Dust. Mineral	Sept., 1912. With sprays, & wetting. Milligrams. Total Dust. Mineral.
9 a.m. to 10 a.m.	280.0	32.0	3.3
11.30 a.m. to 12.30 p.m. ...	130.0	21.0	0.2
2 p.m. to 3 p.m.	80.0	39.0	2.1
4.15 p.m. to 5.15 p.m. ...	100.0	14.0	17.1

It will be seen that the introduction of sprays in the underground workings had a marked effect on the amount of dust in the air which had circulated through the mine. More recent experiments in the upcast air of mines, at times other than immediately after blasting, show very small quantities. Thus, at the City Deep, the average of 13 experiments was 1.6 milligrams. At the Brakpan Mines, the average was 1.5 milligrams. (*e*) *General.*—The amount of fine dust in the air of Johannesburg, as ascertained from 18 measurements taken in the streets during April and May, 1912, ranged from 2 milligrams to 16.5 milligrams of mineral dust. If these measurements had been taken in the same manner as in foreign cities, namely, total dust, the results would have been much higher. The average amount of dust (total), present in the streets of Paris, is quoted at 7.5 milligrams, or, after eight days of dry weather, 23 milligrams.

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*See Transactions of Institution of Mining and Metallurgy, 1904.

†On two other occasions, under these circumstances, the dust was returned at 510 and 425 milligrams, respectively.

(*To be continued.*)

Good Positions Vacant.

For those holding Certificates as Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings, corner Eloff and Pritchard Streets, Box 2061.

WANTED.

Partner with £12,000 Cash, to equip Large Low-Grade Gold Property in Rhodesia. Apply to—
J. G. WALTER, Golden Valley, Gatooma, Rhodesia.

THE JULY OUTPUT: GROUP RETURNS.

Results Affected by the Strike—An All-Round Decline in Tonnage.

Rand Mines Group.

The following are the results of crushing operations of subsidary companies for the month of July:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep	300	7	61,260	16/ 4	17,454	£23,149
Geldenhuis Deep	300	7	48,600	25/ 0	16,596	8,964
Nourse Mines ...	260	7	47,100	21/ 9	16,614	18,480
Ferreira Deep ...	245	7	49,600	20/ 0	24,706	53,952
Crown Mines ...	660	26	181,500	16 6	64,348	119,933
Durban Rood. D.	100	3	23,610	24 4	7,781	3,859
Totals & averages	1865	57	411,670	19/ 0	117,499	£228,337

The following are the results of crushing operations of Central Mining Companies for the month of July:—

Company.	No. of Stamps.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B.	80	5	27,100	18 8	15,661	£40,446
New Modder ...	180	7	30,050	23/ 0	16,181	33,367
City Deep ...	150	9	33,700	27/ 9	16,502	22,140
Village Deep ...	180	7	35,100	24/ 3	12,359	9,196
Village Main ...	220	6	33,800	18/ 9	11,869	30,373
Robinson	250	6	52,900	14 3	21,273	51,502
Bantjes	100	3	23,000	23/ 1	7,955	6,811
Totals & averages	1160	43	235,650	20/10	104,800	£193,835

With reference to the foregoing two statements of the July outputs of the Central Mining-Rand Mines group, we are advised by the secretary as follows:—

Modderfontein B.—From the above profit must be deducted special expenditure of £3,361 in connection with strike. Decreased tonnage milled due to strike. Increased yield due to realisation by-products.

Mew Modderfontein.—From the above profit must be deducted special expenditure of £6,673 in connection with strike. Decreased tonnage milled due to strike.

Rose Deep.—From the above profit must be deducted special expenditure of £3,552 in connection with strike. Decreased tonnage milled due to strike. There was general decrease in grade from current workings.

Geldenhuis Deep.—From the above profit must be deducted special expenditure of £4,211 in connection with strike. Decreased tonnage milled due to strike.

Nourse Mines.—From the above profit must be deducted special expenditure of £3,089 in connection with strike. Decreased tonnage milled due to strike.

City Deep.—From the above profit must be deducted special expenditure of £3,679 in connection with strike. Decreased tonnage milled due to strike.

Village Deep.—From the above profit must be deducted special expenditure of £4,861 in connection with strike. Decreased tonnage milled due to strike, and accident already advised.

Village Main Reef.—From the above profit must be deducted special expenditure of £3,131 in connection with strike. Decreased tonnage milled due to strike.

Ferreira Deep.—The number of stamps working for the month was 215. From the above profit must be deducted special expenditure of £3.543 in connection with strike. Decreased tonnage milled due to strike.

Robinson.—From the above profit must be deducted special expenditure of £3,106 in connection with strike. Decreased tonnage milled due to strike.

Crown Mines.—From the above profit must be deducted special expenditure of £10,557 in connection with strike. Decreased tonnage milled due to strike and native labour shortage.

Bantjes.—From the above profit must be deducted special expenditure of £2,237 in connection with strike. Decreased tonnage milled due to strike.

Durban Roodepoort Deep.—From the above profit must be deducted special expenditure of £2,009 in connection with strike. Decreased tonnage milled due to strike.

The Albu Group.

The July operations of the producing mines of this group were as follows:—

Company.	Stamps.	Tons Crushed	Total Cost.
Aurora West	80	13,420	£13,724
Meyer and Charlton	75	13,006	12,615
New Goch	120	23,600	21,513
Roodepoort United	50	20,814	22,048
Van Ryni	135	28,200	24,966
West Rand Consoildated ...	100	26,600	32,035
	560	125,000	£126,901

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	20/ 5·4	£17,714	£3,990
Meyer and Charlton	19/ 4·8	32,313	19,698
New Goch	18/ 2·8	23,166	1,653
Roodepoort United	21/ 2·2	22,256	208
Van Ryn	17/ 8·5	39,810	14,844
West Rand Consolidated ...	24/ 1·0	38,491	6,456
		£173,750	£46,819

The results from each of the mines are to some extent adversely affected by reason of the strike which took place at the commencement of the month.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	39,670	£62,211	£24,353
Wolhuter	26,800	35,304	7,827
Consolidated Main Reef...	19,863	32,345	7,776
Main Reef West	17,350	26,041	2,633
Knight Central	20,720	23,219	*1,551

*Loss. Total for group, £41,038

The above results are arrived at after writing off special expenditure in connection with the strike, amounting to: Main Reef West, £1,991 5s. 9d.; Wolhuter, £1,750 3s. 5d.: Witwatersrand Deep, £3,169 16s. 3d.: Knight Central, £2,510 1s. 11d.; Consolidated Main Reef, £2,520 1s. 6d.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for last month of the undermentioned companies of the Consolidated Gold Fields group:

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ...	320	7	65,400	14,267	£23,954
Robinson Deep	200	10	54,300	16,974	28,564
Knights Deep	400	11	61,800	9,368	*4,553
Simmer Deep	180	9	52,900	9,625	2,972
Jupiter	120	6	34,250	8,129	1,613
Sub Nigel	25	1	5,010	1,946	1,405
Totals	1245	44	273,660	60,309	£53,955

*Loss.

Reserve Gold Simmer and Jack, 1,750 ozs.; Robinson Deep, 1,571 ozs.; Simmer Deep, 1,250 ozs.; Jupiter, 850 ozs.; Sub Nigel, 600 ozs.; total, 6,021 ozs.

The sundry revenue included in the above total declared profit is as under: Simmer and Jack, £2,500; Robinson Deep, £713; Knights Deep, £3,208. Simmer Deep, £775; Jupiter, £410; Sub Nigel, £390; total, £7,996.

Jupiter.—Above returns include 279 ozs. fine gold valued at £1,169 cleaned up on account of strike during month of July. Stock of the gold in the plant should be in the ordinary course augmented by this amount during month of August. Owing to scarcity of native labour on 24th July work was practically suspended in the western section of mine. Operations for month of July would have shown loss but for profit derived from milling (for cost of transport) of a considerable tonnage lying already broken in the western section of mine.

Simmer Deep.—Above returns include 411 ozs. fine gold, valued at £1,723, cleaned up on account of strike during month of July. Stock of the gold in the plant should be in the ordinary course augmented by this amount during month of August.

Knights Deep.—The shutdown due to the strike was prolonged for five days to complete change over to new plant and also to effect certain alterations and additions in the crusher station. After crushing was recommenced a series of winding accidents delayed reaching full tonnage, and this has necessitated taking an undue proportion of ore from the poorer western section of mine, so that the mine did not get a fair start until the end of July. Knights Deep results do not include 769 ozs. of gold from dismantled mill plates the proceeds of which, namely, £3,225, will be earmarked for additions to plant.

Brakpan Mines.

The following information in respect of the July, 1913, output has been supplied us:—Stamps working, 160; running time, 19 days; ore crushed, 39,630 tons; tube mills working, 8; ore hoisted, 44,538 tons; ore from dump, 1,560 tons; waste sorted, 11·43 per cent.; fine gold declared, 12,932 ozs.; value declared, £54,441, equal to 27s. 6d. per ton milled; working costs, £46,436, equal to 23s. 5d. per ton milled; working profit, £8,005, equal to 4s. 1d. per ton milled. Working costs include total expenditure directly incurred in connection with strike amounting to £4,611. Fixed charge for development has been increased to 2s. 6d. per ton milled in view of small percentage payable for the time being and restriction of tonnage milled owing to shortage of labour.

Barnato Group.

The following are the operations of the Barnato Group for the month of July:—

Cons. Langlaagte ...	100	42,850	£55,232	£17,203
Ginsberg	80	12,490	17,712	3,759
Glencairn	160	19,620	14,945	1,499
New Primrose	160	23,300	33,777	17,138
New Rietfontein ...	120	14,000	15,347	*311
New Unified	60	11,320	14,380	3,681
Quest	35	3,906	2,944	142
Witwatersrand	220	32,870	40,233	16,205
July totals	935	160,356	£194,570	£59,316
June totals ...	935	180,341	£221,705	£84,369

* Loss.

Monthly gross profits for 1913: January, £79,198; February, £74,114; March, £81,152; April, £82,350; May, £81,949; June, £84,369; July, £59.316.

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Note.—All special expenditure in connection with the strike of miners has been included in the working costs for July.

MINING MEN AND MATTERS.

Sir Joseph Robinson, Bart., has returned to South Africa.

* * * *

Mr. F. L. Schaefer, sub-manager of the Ingersoll-Rand Drill Co., Ltd., for the last three years, leaves by Monday's mail for the States.

* * * *

Mr. B. Kitzinger, a London Director of the Consolidated Mines Selection Company and affiliated companies, is visiting Johannesburg.

* * * *

The Chapter of the Order of St. John of Jerusalem has awarded E. P. Cloete the bronze medal of the Order for endeavouring to rescue a comrade at the Rose Deep Mine on April 4 last.

* * * *

Mr. H. B. Bateman, Assoc.Inst.M.M., has left for Portuguese East Africa, and expects to be away about six months.

* * * *

The President and Secretary of the Institution of Mining and Metallurgy left London on July 12th for Canada, to attend the International Geological Congress. The other official delegates from the Institution to the Congress are: Sir Thomas H. Holland, Mr. A. G. Charleton, Dr. J. A. L. Henderson and Mr. Stephen Vivian.

* * * *

A special meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 25th August, 1913, at 8.15 p.m., to consider, and if thought fit, to adopt the following amendment to Section IX. (1) of the rules of the Society, viz.:—That the following words be added to Section IX. (1):—"or at such date as may be decided by the Council." The rule as amended will thus read:—"The annual general meeting of the Society shall be held in the meeting room of the Society on the last Monday of January in every successive year, or at such date as may be decided by the Council." Immediately after the special meeting the ordinary monthly meeting of members of the Society will be held. Business: The minutes of the ordinary monthly meeting held on the 30th June, 1913, will be read. The following papers will be open for discussion:—"Notes on a section from Barberton to the Komati River," by David Draper (hon. member); "The Bushman's River Cretaceous Rocks," by E. H. L. Schwarz, A.R.C.S.; "The Geology of Katanga and Northern Rhodesia—an Outline of the Geology of South Central Africa," by F. E. Studt, A.R.C.S. The following paper will be read:—"The Cassiterite Lodes of Leeuwpoort (938); the Paragenesis of the Lode-forming Minerals," by David P. MacDonald, M.A., B.Sc.

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Rhodesian Section.

LATEST MINING NEWS.

Globe and Phoenix Roasting Plant Closed Down—Chamber of Mines' Report—Beira Railway Outlook—Radnor Claims—Bechuanaland Exploration Company.

It is understood that the roasting plant at the Globe and Phoenix mine has been closed down temporarily and all employees have been paid off. The suspension of operations is due to the decision of the management to instal ore driers, and it is probable the plant will be closed down for four or five months.

* * * *

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of June contains the following:—Receipts during the month amounted to £103 12s. 5d., and payments to £106 15s. The balance to credit of current account on 30th June was £344 19s. 6d. £2,000 was withdrawn from fixed deposit and placed on loan at a favourable rate of interest. Fixed deposits now total £600. The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of April and May, 1913:—

	April, 1913.	May, 1913.
Local	11,627	13,238
Portuguese Territory ...	5,730	5,966
N.W. Rhodesia	2,924	2,885
N.E. Rhodesia	5,528	5,064
Nyasaland	6,009	5,716
Other Sources	954	816
	32,772	32,685

The number of natives employed in May shows a decrease of 4,541 when compared with the corresponding month of 1912. A communication has been received from the Beira and Mashonaland and Rhodesia Railways stating that it has been decided to revise the scale of rates charged on rough and undamagable goods used for mining purposes. The date of the proposed reductions is now under discussion, and consideration is being given to the question of the items on which the reductions should be made. The draft agreement with the Union Castle Mail Steamship Co., Ltd., in regard to the revised sea freight on bullion is being considered by the Committee, and should shortly be ready for signature.

* * * *

Presiding on the 4th ult. at the meeting of the Beira Railway Company, Mr. Rochfort Maguire referred in detail to the results attending the company's working for the year ended September 30, 1912, and for the seven months to April 30 last. He pointed out that the ratio of working expenses to gross receipts for the last mentioned period had been reduced from 36·8 per cent., as compared with 40·3 per cent. for the previous year—a reduction which, he pointed out, was the more satisfactory in view of the numerous reductions of rates that had recently been made. The figures presented in the accounts had shown that slackening on the rate of acceleration which he warned the shareholders last year must be expected in enterprises which served the development of new countries. He would not have been surprised if that slackening had gone further; but so numerous were the channels which they supplied with traffic, so accumulative the development and progress which was going on in Rhodesia, in spite of certain features not of a favourable character, that their latest returns showed an elasticity which augured well for the company's future. When a satisfactory equipment of the Port of Beira was secured, he believed that the company would be fully able competently to deal with the greatly increasing traffic which would pass over their line.

* * * *

The following cable was recently despatched to the London and Rhodesian Mining Company regarding the Radnor claims:—Total footage driven and sunk for the month is 212 ft. No. 1 shaft—Sunk 24 ft., total 228 ft. 200 ft. level—main north cross-cut driven a further 21 ft., total 26 ft.; cut reef at 18 ft. in; total width so far exposed, 7 ft.; from 0 to 1 ft. assays 1 dwt. 12 grs.; from 1 ft. to 6 ft., 12½ dwts.. full width not exposed, face still in ore. Winze 78 ft. west has been sunk 14 ft., total 63 ft.; from 50 ft. to 60 ft. assaying 2 ozs. 2 dwts. over 54 ins. Cross-cut No. 1 south driven a further 24 ft., total 48 ft.; from 43 ft. to 48 ft. cut continuation parallel reef, assaying 27 dwts. over 30 ins.

* * * *

The directors of the Bechuanaland Exploration Company in their report for the year ended March 31st last, state that the shares and interests realized during the year resulted in a profit of £3,425. A sum of £20,141 8s. 1d. has also been received in dividends, interest, rents, fees, etc., in London and South Africa. During the past year the South African share market has continued unfavourable, which fact has again entailed a serious depreciation in the shares held in mining undertakings, but the value at March 31, 1913, taken as a whole, was in excess of the amount at which they stand in the balance sheet. After providing a sum of £16,234 for development and depreciation account and leaving a balance of £500 to the credit of that account, the net profit for the year amounted to £7,616, which, added to the amount brought forward from the previous year, makes a total of £8,516 to the credit of profit and loss account at March 31 last. The directors recommend the payment of a dividend of 4 per cent.

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THE WEEK IN THE SHAREMARKET.

Improving Tendency—Brighter Outlook—Return of Peace.

Peace in the Balkans and the return of normal conditions on the Rand are beginning to make their effect seen on the market. Without any great amount of business doing, there has been a gradual firming up in prices, and confidence is slowly returning. The declaration of the delayed dividend of the E.R.P.M. on Thursday seems to have caused an excellent impression in London, and the decline in the July profits of the mines, owing to strike expenditure, was not unexpected. Zaaiplaats shares showed a notable improvement during the week, and the mine is said to be looking extremely well. Rooibergs were quiet. Among diamond stocks, Crowns were active on the very good reports from the mine; and Frank Smiths were likewise firmer. In a better market tins and diamonds should appreciate considerably, and prove popular counters.

As regards Rhodesians, London reports by mail that a little buying has been reported of specialities, but the showing made by the Gold Fields Rhodesia Company has militated against general market improvement. Since its inauguration this company has suffered from depreciation of its investments to the tune of upwards of £1,000,000 sterling, and cash resources are now greatly strained. In the circumstances it is fortunate that there is, as Lord Harris says, a "fairy godmother," in the shape of the Consolidated Gold Fields, to fall back on. The Amalgamated Properties reconstruction scheme has been agreed to, and it is, at least, satisfactory to find that the outstanding differences with Sir Abe Bailey are in a fair way to be settled. The directors of the Falcon have issued an official statement regarding the assays, from which it appears that the check samplings are, on the whole, more favourable than the figures given by the independent engineers. As regards the Cam and Motor, all sorts of bear rumours have recently been in circulation, but those closely in touch with the position continue to be confident as to the future of this undertaking.

	Friday, 1st.	Sat., 2nd.	Tues., 5th.	Wed., 6th.	Thurs., 7th.
Adair Usbora	—	—	—	0 6B	0 6B
African Farms	15 0	14 6	15 3B	14 6	14 6B
Apex Mines	19 6	18 0B	18 0B	18 0	18 9
Bantjes Consolidated ..	15 3	14 6	15 3B	15 3B	15 3B
Benoni Consolidated ..	3 0	2 9B	3 0B	—	3 0s
Blaauwbosch Diamonds ..	—	90 0B	90 0B	—	90 0†
Brakpan Mines	60 0B	60 0B	61 0B	60 0B	61 0B
Breyten Collieries.. ..	25 0B	26 0B	—	25 0B	25 0
British S.A.	—	—	—	19 6s	—
Bushveld Tins	0 5B	1 0	—	0 9B	—
Cinderella Consolidated ..	—	10 0s	10 0s	—	—
City & Suburbans (£4) ..	42 6	43 0B	43 6B	43 6B	44 9s
City Deeps..	52 6B	52 0B	—	52 6B	52 6B
Cloverfield Mines	4 0B	4 3	4 3B	4 4	4 3B
Clydesdale Colls.	—	—	7 0B	7 6B	—
Cons. Langlaagtes ..	24 6B	25 0B	25 3B	25 9s	—
Consolidated Main Reefs	16 0B	15 9B	16 9B	16 9B	16 9B
Cons. Mine Selection ..	—	—	—	9 0s	—
Coronation Colls.	10 0B	—	—	—	—
Coronation Freeholds ..	0 4B	0 5B	—	0 5B	—
Crown Diamonds	10 6	10 6*	11 0	10 3B	10 6
Crown Mines (Deb.) ..	£90B	£90B	£90B	£92B	£90B
East Rand Centrals ..	8 0B	7 9	7 9B	7 9B	7 6B
East Rand Coals (2/6) ..	1 9B	1 9B	1 11	1 10B	1 10B
East Rand Deeps.. ..	1 10B	—	1 9B	1 7	1 7
East Rand Props ..	46 0B	45 6B	45 6B	45 6B	46 0B
East Rand Debs. ..	£90s	£90s	£90B	£90B	£90
Eastern Golds	—	1 0B	—	—	1 0B
Frank Smith Diamonds	11 0	10 9	11 0	10 6	10 6
Geduld Props.	20 3B	19 6B	20 0B	20 3B	20 3B
Glencairns	—	—	—	—	2 3B
Glencoe (Natal) Colls. ..	6 6B	6 6B	—	—	7 0B
Glynn's Lydenburgs ..	14 0B	14 0B	13 6B	13 6	14 6s
Government Areas ..	20 3	19 9	20 3	19 9	19 9B
Hex River Explorations..	—	1 0s	—	—	—
Jumpers	—	—	5 0s	5 0s	4 6s
Jupiters	—	6 6	6 0B	—	—
Kaalfontein D. (2/6) ..	—	—	—	0 4B	0 4B
Klerksdorp Props. ..	2 3B	2 4B	2 5	2 4B	2 4B
Knight Central	8 6	8 6B	9 0	8 6	8 0B
Lace Props.	3 0	3 1B	3 1B	3 1	3 1B
Lydenburg Gold Farms ..	2 9B	3 0	2 11B	2 11B	2 10B
Main Reef Wests ..	8 9B	8 6B	9 6B	9 6B	10 0s
Meyer and Charltons ..	100 0s	100 0s	—	—	—
Middlevlei Estates ..	1 0B	1 0B	1 0B	1 0B	1 0B
Modder B's	73 6B	—	—	73 6B	73 6B
Modder Deeps	28 9	28 6B	29 3B	29 9	29 9s
Natal Navigation Col. ..	—	—	—	16 0s	14 6
New Era Cons. (5/-) ..	6 3B	6 6B	7 0	6 6B	—
New Geduld Deeps ..	—	1 10B	1 10B	1 10B	—
New Kleinfonteins ..	17 0B	19 0	19 0B	19 6	—
New Unifieds.	—	—	—	14 6s	14 3s
Nigels	—	—	—	15 0B	16 0B
O.F.S. & Trans. Diamonds	1 6	1 4B	1 5B	—	1 4B
Pretoria Cement Co. ..	49 0	48 0B	48 6B	48 6B	48 6B
Princess	4 0B	5 0B	4 6B	4 6B	4 6B
Rand Collieries	—	—	4 0s	—	—
Rand Klips	1 4B	1 4B	1 4B	1 6B	1 6s
Rand Nucleus	—	2 3B	2 0B	2 0B	2 3B
Randfontein Deeps ..	3 0B	3 3B	3 6	3 3	3 3B
Randfontein Estates ..	25 0B	25 3B	25 6B	25 6	25 3B
Roberts Victors	—	—	26 0B	—	28 6B
Robinson Deeps	31 0B	—	32 0B	—	—
Rooiberg Minerals ..	30 0	29 0	29 0	—	29 0B
Rood.-Durban Deeps ..	—	—	—	28 6B	—
Shebas	—	4 9B	5 0B	5 3B	5 3B
Simmer Deeps	2 3B	—	2 0B	—	—
S.A. Breweries	38 6B	39 0B	39 0B	40 0s	38 0B
S.A. Lands	3 0B	3 2	3 3	3 2	3 3
Springs Mines	15 3B	15 9	15 9B	15 9	15 6B
Sub Nigels	10 6	10 9	10 3B	10 3	10 0B
Swaziland Tins	39 0B	43 6B	—	—	40 0B
Trans. Coal Trusts ..	37 0	36 3s	36 3B	36 0B	—
Trans. G.M. Estates ..	51 0B	50 0B	51 0B	51 6	51 6B
Van Ryn Deeps	30 3	29 9	30 9	30 0B	29 9B
Village Deeps	37 0B	37 0B	—	—	—
Vogel. Cons. Deeps ..	1 0B	—	—	—	—
Wes Rand Estates ..	—	—	—	3 6B	—
Witbank Collieries ..	42 0B	—	41 0B	41 6B	41 6B
Witwatersrands	62 6B	62 6B	63 0B	62 6B	63 0B
Wit Deeps	51 9	51 0B	51 6B	52 0	51 6
Wolhuters	14 6	14 0	13 6B	13 0B	13 3B
Zaaiplaats Tins	34 6	33 6B	33 6B	34 6B	37 6B

B Buyers. s Sellers. * 40 Shares. † 30 Shares.

Crown Diamonds.

The Secretaries write:—"I beg to advise you that after trial runs of the new washing and hauling gear had been satisfactorily made, the haulage and washing of blue ground has been commenced."

Frank Smith Diamonds.

The following cable message has been despatched to the London office of the Frank Smith Diamond Estates and Exploration Company: "Results for July, 24,469 loads washed, 1,232 carats diamonds found. This includes stone 27½ carats, good quality."

Blaauwbosch Diamonds.

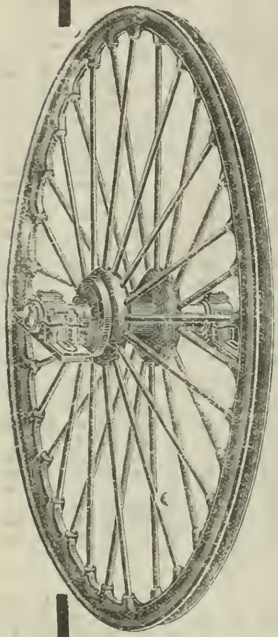
The result of washing for July at the Blaauwbosch Diamond Mine is 9,682 loads washed; 2,288 carats recovered, or 23·61 carats per 100 loads.

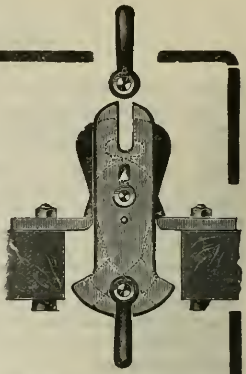
Roberts Victor Diamonds.

The following was the result of the working of the Roberts Victor Diamond Mine for the month of July: Washed 19,346 loads, which yielded 5,534½ carats—an average of 28·6 carats per 100 loads for the month.

Kumst Diamonds.

The secretary of the Kumst Diamonds, Ltd., states that the new company has been arranged for in London with a capital of £150,000, divided into shares of £1 each. The shareholders of the present company will receive in the new company three shares of £1 each for every five shares of 2s. 6d. each in the present company.





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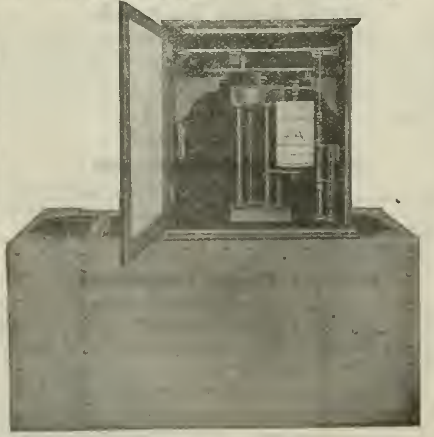

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4. Measurement of CYANIDE, Oil, Acid or Alkali liquors.
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Engineering Notes and News.

The Humphrey Internal Combustion Pump.

A prospectus was issued last week of the Humphrey Pump Co., Ltd., which is being formed with a capital of £200,000 to exploit the patent Humphrey internal combustion pump, which has recently created such great interest in engineering circles in connection with its installation at the new Chingford reservoir of the Metropolitan Water Board. The Humphrey pumps at Chingford were successfully started in the month of March, 1913, and consist of four units, each capable of delivering 40,000,000 gallons per day, and one unit capable of delivering 20,000,000 gallons per day. As regards cost, the reports of the Works and Stores Committee of the Metropolitan Water Board, dated the 11th and 26th October, 1910, stated:—" The total cost of the (Humphrey) pumps, buildings, and also two cottages would be about £41,000, as compared with £60,000 for vertical enclosed triple expansion engines." The contract for the Chingford pumps was taken on account of their novelty upon special terms, but the design of the pump has since been further simplified and cheapened with a view to maintaining a similar advantage in prime cost when tendering for future installations. In addition to the low first cost, the Humphrey pump has a further important advantage, as experience with the Chingford pumps, it is stated, has shown that the coal consumption is less than one-half of that which would be required for steam-driven centrifugal pumps. The system underlying the Humphrey pump lends itself, not only for the purpose of raising water, but can be employed for the economical pumping of sewage, for which there is a large field open. The system can easily be adapted to compressing air, and an experimental Humphrey Compressor has already been erected in America, and it work has shown that its range of pressures meets the usual requirements of blast furnace practice. Specific patents have been secured with the object of adapting the system to ship-propulsion.

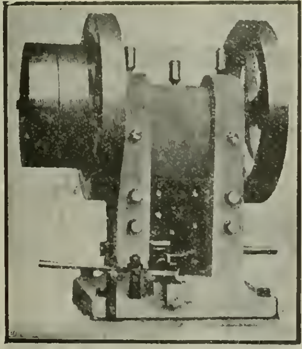
Queenstown Electric Lighting.

One of the most recent South African towns to inaugurate an electricity undertaking is the Municipality of Queenstown, which has a population of 3,775 white and 5,000 coloured people. Though a small installation, it is nevertheless interesting, being a departure from the usual practice as Diesel oil engines have been installed. The plant was started up on November 9th last year, and bids fair to have a very successful career; Mr. W. Bellad-Ellis is the municipal electrical engineer, to whom we are indebted for the particulars here given. The whole scheme was designed and laid down by Mr. Bellad-Ellis, whose estimate for the work was £12,800, while the actual sum expended, exclusive of house services and meters, was £12,300. The generating plant consists of two 100-h.p. Diesel engines manufactured by Messrs. Mirrless, Bickerton & Day, which consume crude oil costing 9d. per gallon; the engines run at a speed of 250 r.p.m., and it is interesting to note that the running costs are considerably lower than for suction gas. The engines are coupled direct to G.E.C. direct-current generators of 70 k.w. each, at 460 volts. A balancer is also installed capable of dealing with 35 amperes out-of-balance current without assistance from the battery; also a booster capable of maintaining a 72-ampere charging rate to the battery, both these machines being supplied by the G.E. Co. The battery consists of 258 Tudor cells of 190 ampere-hours capacity, and it carries the light load as well as assisting during the peak load. The plant is housed in a brick building, 60 ft. long by 50 ft. wide, which again is a departure from the usual wood and iron building and steel stack. The switchboard was supplied by the G.E. Co., and consists of two generator and nine circuit panels, also booster, battery and balancer panels, and is fitted with the usual recording instruments, etc. The distribution is on the three-wire system (220-440 volts d.c.), being partly overhead and partly underground; the underground cables were supplied by Messrs. Henley, and consist of two, three and four-core cables of from ·15 sq. in. to ·0125 sq. in. section, all armoured and paper-insulated, there being a total length of 6½ miles. The overhead routes have a total length of 16 miles, and consist chiefly of No. 00 bare copper wire, carried on 25 to 35 ft. Mannesman steel poles, numbering about 550. During the few months of running, 328 consumers have been connected for lighting, as well as a few small power consumers, all connections being made overhead through pole fuses. Ferranti meters are used, and the price of current is 1s. per unit for lighting, and 6d. per unit for power. The street lighting is by means of Osram lamps, and consists of 56 100-c.p. and 180 50-c.p. lamps, spaced about 100 yards apart, the mileage of streets lighted being 13 miles. The lamps are extinguished at 11.30 p.m.

Mining Machinery Exports and Imports.

SIX MONTHS ENDED JUNE 30.

EXPORTS.	QUANTITIES.			VALUE.		
BRITISH To	1911. Tons.	1912. Tons.	1913. Tons.	1911. £	1912. £	1913. £
Europe ..	720	753	790	30,292	34,850	49,574
U.S.A. ..	52	8	36	2,009	663	2,108
S. America ..	716	486	874	34,174	26,111	39,186
British S. Africa	7,267	6,249	7,175	245,755	209,895	244,261
British E. Indies	640	732	894	24,281	32,043	47,700
Australia ..	1,019	639	608	42,396	24,175	20,152
New Zealand ..	475	287	323	15,002	8,665	15,724
Other Countries	3,165	2,950	3,443	108,166	110,806	119,765
Total ..	14,054	12,104	14,143	502,075	447,208	538,470



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Finance, Commerce, and Industries.

Rhodesia Railways Trust. The report of the Rhodesia Railways Trust, Limited, for the year to March 31 last states that the number of shares in the Rhodesia and Mashonaland Railway Companies held by the company remains unchanged. During the year ended September 30, 1912, the working of the Rhodesia Railways showed a profit of £242,774, after meeting all fixed charges, as against £240,496 for the previous year. The accounts of the Mashonaland Railway Company showed a deficiency of £107,422, after paying debenture interest and making provision for similar fixed charges. The deficiency for the year ended September 30, 1911, was £66,432. The most marked feature of the results for the year 1911-12 was perhaps the increased working expenditure. The debt due from Rhodesia Railways had been reduced to £14,514 at March 31 last. The Mashonaland Railway had required further financial assistance, and its debt had been increased at the same date to £778,325.

* * * *

South African Preference to Local Manufacturers. Certain revised regulations governing the practice of the Union Government Tender Board in relation to the award of contracts appeared in the Official Gazette of May 6. One of them reads as follows, but we are under the impression that it does not appreciably vary the existing practice of the Government departments:—" Heads of departments when recommending tenders to the board, and the board when considering tenders, shall, in comparing tenders received, allow a preference of 5 per cent. on supplies produced within the Union of South Africa or manufactured within the Union from articles grown within the Union, and a preference of 2½ per cent. on supplies manufactured within the Union from imported ingredients or partly so." Another regulation runs:—" Whenever it is deemed advisable to call for tenders outside the Union of South Africa as well as within the Union, the advertisement calling for tenders shall be published in the Union at such time and in such manner as will place persons carrying on business within the Union on an equality with persons outside the Union as regards facilities for submitting tenders."

* * * *

A Veritable Wonderland. To my mind—observed Mr. Frederick Mead, chairman of the South African Breweries, Limited, in the course of his speech at the company's meeting, as was reported in a recent issue —South Africa is a veritable " Wonderland," where everything is to be found—vegetable, animal, and mineral, and of the best quality. There are many fields offering promise of profit besides gold fields. The world's supply of meat is already becoming a serious matter, and where are we to look for relief, except to South Africa? The very high prices that meat commands upon the Continent of Europe make it inevitable that large markets must be thrown open there at no distant date. Years ago South Africa supplied India with horses. Why not again? Where is finer fruit grown? Where better sugar or tea? Where better ostrich feathers or wattle bark? Where are there more extensive coal fields? There is no maize in the world to equal the maize that can be grown in South Africa, and I have been bold enough to tell my American friends that we shall yet have a market for our maize in that great country. One hears that the American markets for wool are to be opened, and, in that case, there will be such a demand as South Africa cannot supply for years to come. There is a field for all the maize South Africa can grow at more profit to the ton than can be got out of a ton of ore, and the price can be held up by converting surpluses into beef or pork and shipping in that form. A careful Government, devoting its energies to the true interests of the country, could, by the conservation of water, improve the prosperity of South Africa tremendously. If the vast rainfall now permitted to run uselessly to the sea, carrying with it some of the best soil of the country, were conserved, what a difference there would be! There is a lasting fame awaiting the Union Minister who will devote himself to the special question of irrigation improvements on a great scale. The percentage of people who have prospered, either in or from their connection with South Africa, is as large, I believe, as in any place in the world, and, with or without Government assistance, South Africa is bound to go ahead, though in the former case the pace might be accelerated.

* * * *

Sea-borne Traffic. The following is a statement showing, for the month of June, 1913, the approximate tonnage and percentage of tonnage of commercial sea-borne traffic forwarded from the different coast ports to stations within the competitive zone, *i.e.*, Vereeniging-Pretoria, Springs-Klerksdorp inclusive, and including the South Rand and Vereeniging-Canada Junction lines:—Group I., normal, intermediate, and intermediate B.: Cape ports, 3,219 tons; Natal, 8,502 tons; Lourenco Marques, 12,280 tons. Group II., rough, rough B., rough C., imported produce, fencing and fertilisers: Cape ports, 2,010 tons; Natal, 5,146 tons; Lourenco Marques, 9,036 tons. Totals: Cape ports, 5,229 tons; Natal, 13,648 tons; Lourenco Marques, 21,316 tons. Group I.: Cape ports, 13·41 per cent.; Natal ports, 35·42 per cent.; Lourenco Marques, 51·17 per cent. Group II.: Cape ports, 12·41 per cent.; Natal ports, 31·78 per cent.; Lourence Marques, 55·81 per cent. Totals: Cape ports, 13·01 per cent.; Natal ports, 33·96 per cent.; Lourenco Marques, 53·03 per cent.

* * * *

Building Activity. The estimated values of buildings, the plans of which have been approved by South African Municipalities during 1912, according to the annual report of the White Labour Department, are as follows:—Benoni, £154,554; Boksburg, £49,196; Germiston, £80,726; Johannesburg, £1,611,830; Krugersdorp, £88,420; Potchefstroom, £10,193; Pretoria, £155,418; Roodepoort, £36,500; Springs, £19,055; Adelaide, £1,600; Capetown, £103,395; Claremont, £5,411; Cradock, £7,800; Durbanville, £2,367; East London, £9,215; Fraserburg, £1,200; Graaff-Reinet, £400; Green and Sea Point, £24,000; Hanover, £900; Kimberley, £6,115; Kalk Bay, £51,680; Montagu, £3,315; Mossel Bay, £5,000; Mowbray, £2,185; Maitland, £1,200; Oudtshoorn, £8,460; Pearston, £623; Queenstown, £11,298; Rondebosch, £19,906; Simonstown, £57,485; Stellenbosch, £8,000; Steytlerville, £6,300; Van Rhynsdorp, £3,100; Woodstock, £23,431; Wynberg, £20,974; Durban, £221,586; total, £2,812,840. Tenders accepted by Government for public buildings not included in the above, £690,906; grand total, £3,503,747. Grand total for year ended 31st December, 1911, £2,754,013.

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Automobile Notes.

There have been several attempts before now to produce a £100 car, though what particular virtue there can be in this specific price it is difficult to understand. However, the demand is undoubtedly there, and nothing at either 100 guineas or £101 can be expected to satisfy it. Within the last few days two attempts at the solution of this hardy annual problem have been submitted to the public, one in England and the other in America. It is interesting to mark the difference between the two cars. The English production is a very light two-seater, a four-wheeler, of course, driven by a single cylinder air-cooled engine and through an epicyclic two-speed gear; it has no reverse. It is true that the engine is one that has been thoroughly tested and can be relied upon to give complete satisfaction so far as reliability is concerned, but in the matter of pace this English vehicle will hardly pretend to set the market on fire. The American 500-dollar car is a very different proposition. It is a miniature car of exceedingly handsome appearance, and is made for two passengers, either side by side or tandem, and as a four-seater. It has a four-cylinder water-cooled engine rated at 18-24 horse-power, with a 3¼in. bore and the same stroke. The gear box gives three speeds and a reverse, and the bevel drive is on the lines employed in nearly all full-sized cars. It weighs about 7 cwts., and is capable of covering a speed of 50 miles per hour. In the course of time we may see this prodigy on the market, and if it can give a good account of itself it should make a considerable difference to the sales of some of the cycle-cars, which with a much more modest specification come at something near twice the price.

* * * *

The idea has been conceived in America of compressing natural gas, and, in its liquid form, exploiting it commercially as a substitute for petrol, which has risen so enormously in price throughout the world. The project is in the hands of a motor-car firm in Virginia, and up to the present the tests have shown that 600 cubic feet of gas at a pressure of 50 lbs. per square inch can be carried—sufficient to run an ordinary small car from 250 to 300 miles. With increased pressure, however, it is expected that double that quantity can be stored and carried.

* * * *

The gas is compressed at the wells, and the consumption tests show that 45 cubic feet of gas, when compressed, is equivalent to a gallon of petrol. On this basis the company expect, when their arrangements are completed, to be able to sell their product at relatively one-half the cost of petrol. An ordinary carburettor may be used, but experiments are being made with a view to dispensing with that part of the carburration system altogether.

* * * *

The scheme seems to open up wide commercial possibilities in the direction of utilising coal gas in a similar manner. There is no difficulty in the liquifaction. The problem lies in the question of productive cost, which must include the removal of the deleterious impurity, sulphur, present in coal gas. Even if the scheme does not provide a solution to the all-important fuel problem, it may go far towards limiting the increasing demands of the oil trusts. The American patentee is Mr. A. M. Schenck, of the Packers Motor Truck Company, Wheeling, Virginia.

* * * *

Messrs. De Dion Buton have placed upon the market an eight-cylinder car. The cylinders are set V-wise—four on one side and four on the other—with the carburettor and magneto snugly and conveniently housed in the intervening valley. There are four firing strokes with every revolution of the fly-wheel, maintaining the utmost smoothness of running through all speeds. The whole power unit is an excellent specimen of clean and simple construction, and is covered by a bonnet of ordinary length.

* * * *

The adoption of the system of road identification in France by which, within the next twelve months, every kilometer stone will bear the official number of the road alongside which it stands, has been brought about through the efforts of M. Michelin, who, to that end, organised a monster petition, bearing some two hundred thousand signatures.

* * * *

The Society of Motor Manufacturers and Traders have just brought to a successful conclusion an important piece of work largely affecting the interests of owners of motor cars in the matter of tyre upkeep. This is the standardisation of tyre rims, which has, after a great dealt of work and diplomatic negotiation by Mr. T. H. Woollen, as representing the sub-committee of the S.M.M.T. dealing with the matter, been accepted by the leading tyre rim manufacturing firms.

CONTINENTAL
TYRES.
Reduction in Price,
But no Reduction in Quality.
Ask your Garage for New Price List.

Few motorists realise to what degree the faulty fitting of a tyre on the rim is responsible for the troubles that frequently arise after a merely nominal use of the car on the road. In the course of the sub-committee's negotiations, many of the tyre companies themselves were thoroughly surprised at the magnitude of the inaccuracies disclosed when the rims and tyres were subjected to actual measurement. A rim that is too deep causes the inner tube to force down the edges of the tyre, and so to press inwards the side walls which are thus condemned from the start to perform their functions in a distorted condition. If the tube is partially deflated, it may get pinched under the bead, or if the rim is too wide the edges of the tyre are forced apart, the grip of the security bolt is weakened and creeping takes place.

* * * *

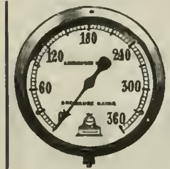
As soon as the necessary gauges can be constructed, the standard dimensions will come into force in the automobile industry, and from that day forward motor-car manufacturers will refuse to fit rims that do not pass the S.M.M.T. standard, and tyre makers will refuse to confirm their usual guarantees in respect to non-standard rims.

* * * *

In concluding his Gustav Canet lecture, Dr. Dugald Clark stated that the increasing efficiency of the internal combustion engine had put great pressure upon steam engine builders, but that the latter had responded by putting up the efficiency of the turbine to a figure which forced the gas-engine designers to seek for further economies. Mr. John Reid and Mr. H. A. Mayor, in a paper on the electric propulsion of ships, considered that no internal combustion engine, either Diesel or other tyre known to them, was an absolute substitute, as far as simplicity and trustworthiness were concerned, for the ordinary up-to-date triple-expansion steam engine, even in deep sea go-ahead work, much less in manœuvring in narrow waters within harbour limits, or in rivers or canals.

* * * *

The development of aerial locomotion has supplied the engineer with sufficient data to enable him to apply aerial propulsion to barges. Some interesting experiments have been made, and the practicability and advantages of the method demonstrated. A flat-bottomed vessel 125 feet long by 16 feet beam, fitted with a 9 h.p. engine, driving a two-bladed propellor 8½ feet in diameter, attained a speed of five miles an hour within half a minute of starting. It is calculated that a propellor of less than 6 feet in diameter will easily draw a 40 to 50 ton barge.



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Manicaland Mineral Output.

The mineral output of the territory of the Companhia de Moçambique (Manicaland) for the month of June, 1913, was as follows:—Gold: Reef: Mill: Gold won (fine gold), 420 ozs. 4 dwts. 9 grs.; tons crushed, 1,658; value, £1,765 9s. 9d. Concentrates (estimated): Gold (fine gold), 43 ozs. 7 dwts. 10 grs.; tons, 8; value, £184 6s. 5d.; silver and lead ores, value £65 16s. Cyanide: Gold recovered (fine gold), 17 ozs. 10 dwts. 19 grs.; tons, 135; value, £73 13s.

AMUSEMENTS.

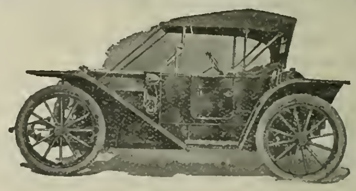
NEXT WEEK'S PROGRAMME

His Majesty's Theatre: John Tiller Company	8.15
Standard:	See bills.
Empire	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9

INVESTORS' DIARY.

The following company meetings have been announced:—

Aug. 26.—Glynn's Lydenburg (Special).
Aug. 26.—Transvaal Gold Mining Estates (special).
Aug. 29.—Treasury G.M.
Sept. 9.—Coronation Collieries.
Sept. 19.—Transvaal Gold Mining Estates (special).
Sept. 19.—Transvaal Gold Mining Estates.
Sept. 26.—Simmer and Jack Prop.
Sep 26.—Sub-Nigel.
Oct. 29.—Rooiberg Minerals.
Oct. 31.—Knights Deep.



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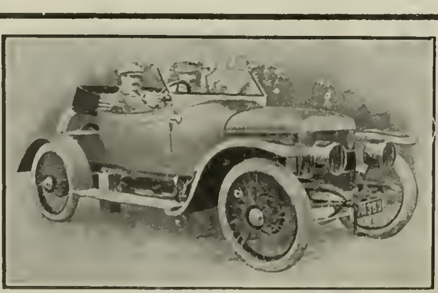

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METAL-MINE ACCIDENTS DURING 1911.

Some Interesting Comparisons—Rates for Other Countries.

[COMPILED BY ALBERT H. FAY. *

FATAL accidents in metal mines in the United States are more numerous in proportion to the number of men employed than are the fatal accidents in coal mines. This fact is brought out by the figures collected by the Bureau of Mines and presented in this paper. Of the 165,979 men employed in the metal mines in the United States during the calendar year 1911, 695 were killed, which represents a rate of 4·19 per 1,000 men employed, as compared with 3·73 per 1,000 for the coal mines of this country for the same period, and 3·15 per 1,000 in the coal mines during the year 1912. The fatality rate due to accidents in the metal mines in a number of foreign countries is as follows: Transvaal, 4·29 per 1,000 men employed; France, 3·16; Spain, 2·25; Australian colonies, ranging from 0·67 to 2·23; Great Britain, 1·64; Japan, 1·59; Germany, 1·39; India, including coal mines, 1·18. The death rate in Mexico and Peru is much higher than that in the United States, the rate being 5·78 per 1,000 for each country, but it includes the accidents in the coal mines. Comparison of the number of men employed in metal mines of the principal countries, showing the fatality rate per 1,000 men employed:—*a*

Year.	Country.	Number. employed.	Fatalities per 1,000 employed.
	Australia :		
1911	New South Wales	19,363	1·81
1911	New Zealand	7,400	·67
1911	Queensland	13,202	·90
1909	Tasmania	6,054	·99
1909	Victoria (b)	26,473	1·16
1911	Western Australia	16,596	2·23
1910	Austria	20,664	·82
1910	France	18,542	3·16
1910	Germany	109,359	1·39
1910	German West Africa	6,933	1·30
1911	Great Britain	46,341	1·64
1911	India (c)	143,336	1·18
1910	Japan	86,770	1·59
1909	Mexico (c)	81,438	5·78
1910	Peru (c).	20,410	5·78
1910	Portugal	6,554	1·86
1908	Russia	181,334	·98
1909	Spain	96,901	2·25
1910	Sweden	13,775	1·23
1910	Transvaal	218,109	4·29
1911	United States	165,979	4·19

(a) Compiled from official reports. (c) Includes coal mines.
(b) Average for 20 years.

SCOPE OF STATISTICS.

The following tables giving the accidents in the metal mines in the United States for the calendar year 1911 have been compiled by the Bureau of Mines from reports received directly from the operators. The bureau's list of operators contains about 13,000 names, representing all stages of the industry, from the lone prospect to the mine that is on a dividend-paying basis. In the collection of these statistics no distinction was made concerning the magnitude of the operations. The man who is prospecting or doing assessment work certainly encounters many of the dangers that surround his brother working in a large mine. It is barely possible that if statistics were as accurately recorded, reported, and compiled for mines employing 20 men or less, as are the statistics for the large mines employing hundreds or thousands, the casualty rate would be surprisingly high. The prospector is usually far from medical aid and hospital service; many times he is working alone and has no means of communicating with anyone in case an accident occurs; he is exposed to all kinds of weather; and he does not always have the best tools and apparatus, which tend to lessen danger; and for these reasons he should not be ignored when accident statistics are being collected. His work is certainly important and is necessary for the growth of the industry. The first requests for the information contained in this report were mailed early in January, 1912. The majority of these were answered immediately. Second, third, and fourth requests were sent to those who failed from one cause or another to respond, so that eventually replies were received from more than 90 per cent. of the names on the list. A large number reported their mines as "idle," "abandoned," or "out of business." The statistics herein tabulated represent 5,232 operators who actually worked their mines during the year. As far as can be ascertained, all of the large companies made out detailed reports, so that, if measured by production, the statistics given herein are representative of the industry. The small number who did not reply, though representing nearly 10 per cent. of the names on the mailing list, form a much smaller percentage of the industry when compared as to the amount of ore produced. In this number are represented a few prospectors, promotion companies, moribund corporations, and abandoned properties. One reason why some operators did not reply, judging from many of the answers received, is that their mines or prospects were small, and that since no accidents occurred, a reply was not necessary. It is hoped that all of the operators, whether large or small, will consider their property as worthy a report on its mine accidents for the year 1912, giving the number of men employed and the days worked. The true accident ratio can be obtained only when complete reports are furnished. Each mine that fails to report its 4, 6, or 10 men, reduces the total number reported employed, and the State totals, when obtained for the year, are entirely too small. It is believed that the fatal accidents were accurately reported. With all of the fatal accidents reported and all of the miners employed accurately determined, the true rate of killed per 1,000 employed is easily obtained. With all the fatalities reported and only 90 per cent. of the men employed reported, the death rate will appear 11·1 per cent. too high. As an example: Suppose one State reports 50 fatalities when 10,000 men are actually employed. This will give a death rate of 5 per 1,000 men employed. If the totals for the same State show 50 killed and only 9,000 men (90 per cent.) are reported as employed, the death rate is thereby raised to 5·55 per 1,000. This is an injustice to the State, the industry, and the mining companies, which can be removed by each operator making a complete report. A summary of the number employed in all the metal mines in the United States, with the number killed and injured, rate per 1,000 men employed, and the number of widows and orphans is given in Table 1. The causes of these accidents, together with the percentage of accidents due to any one cause, are given in detail in Table 2.

(To be continued.)

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Notes and News.

A Notable Step.

We cordially welcome the announcement that the Chamber of Mines has invited Colonel W. C. Gorgas, Chief Sanitary Officer for the Panama Canal, to come to the Witwatersrand to investigate the sanitation and general health conditions of the mining area, and to report thereon. Colonel Gorgas has been cabled to, and it is hoped he will accept, in which case the investigation will proceed with as little delay as possible. No one who has read of the wonderful work done by Colonel Gorgas at Panama—to which Mr. Samuel Evans so recently paid striking tribute—but will be anxious to see the Chamber successful in enlisting his advice and services in solving our health problems.

* * * *

The E.R.P.M.'s Dividend.

The declaration of a dividend of 12½ per cent. for the half-year ending June by the East Rand Proprietary Mines brings the total distribution of the Witwatersrand gold mines up to £4,050,018 for the six months, or an increase of £527,003 over the announcements in the corresponding period of last year. Similarly the total for all Transvaal mines is brought up to £4,844,524, which is an advance of £634,862 on the January-June, 1912, aggregate. The East Rand Proprietary Company's dividend, declaration of which was postponed on account of the strike, is of 12½ per cent., or 2s. 6d. per share, and involves distribution of the sum of £305,736.

* * * *

Electric Blasting.

The theory that electric blasting on the mines will enable the authorities to cope successfully with the fine dust from blasting—the dust which cannot be caught by respirators, and which is accepted as the most deadly cause of miners' phthisis—is now being put to practical test at several of the leading mines of the Rand. The Corner House people have been experimenting in this direction for some time, and it was announced during the week that the General Mining and Finance Corporation had decided to introduce electric blasting on the Meyer and Charlton mine. During the week four stopes were fired by the electric method with most satisfactory results. The management have resolved to introduce the system throughout the mine. It is hoped to have the electric system of firing so introduced in the mine that blasting will be done by pressing a button on the surface. This secures that the miners will not be forced to inhale the fine dust, and all that is then required is the proper ventilation of the mine before the return of the miners.

* * * *

An Object Lesson.

In no country has labour been so scientifically organised as in Germany, but the result has not been in favour of smooth relations between labour and capital. In 1911 there were 2,566 strikes and 93 per cent. were of an aggressive character, while the number of strikes in one year has reached 3,600, affecting over 500,000 workers. The effect on employers was to bring about united effort against the pressure of organised labour marked by the use of weapons borrowed from the labour unions. Thus, as pointed out by Mr. W. H. Dawson, the modern employers' federation in Germany is the counterpart of the great trade union agglomerations: the Central Office (Hauptstelle) of these federations corresponds to the Trades Council of the labour organisations; the collective lock-out was the employers' answer to the collective strike, the sympathetic lock-out to the sympathetic strike, the strike insurance fund to the trade union strike pay, the employers' labour registry to the trade union registry, the employers' information and advice agency to the workmen's secretariat, the employers' black list to the trade union boycott, and so on. The lesson is obvious.

Natal Coal Trust.

Protests by the public against the so-called Natal Coal Trust led the Secretary for Mines to enquire into it last year, and the following are the conclusions reached by him as given in the annual report issued this week:—" It must be realized by persons who are afraid of what they call a coal trust in the country that the present combine contains only ten of the Natal collieries; that at least five other collieries are not in the combine, and in some respects have interests entirely divergent; and that the whole of these collieries represent less than 50 per cent. of the total output of South Africa. The large and important Transvaal industry, which produced in 1912 4,750,000 tons to the total of 2,760,000 tons of Natal, is selling its coal cheaper than the Natal industry can do, is a rival so far as obtaining an oversea market is concerned, and in other respects has interests diametrically opposed to those of the Natal industry. Until, therefore, there are some symptoms that the Coal Owners' Association of the Transvaal and a combination of the whole twenty-one colliery companies of Natal are arranging to work with common objects and on a common understanding, it is too soon to talk of a general coal trust."

* * * *

Natal Gold Mines.

Prospecting for minerals other than coal in Natal and Zululand has received a serious set-back during last year as a result of the closing down of the Wonder Mine and the disappointments at the Vira. The Secretary for Mines, in his annual report, says that the output from the former mine and the promising indications of the latter had done something during the previous year to encourage people in Natal to take an interest in prospecting in that portion of the country. There is little doubt that both properties have suffered more than they deserved by mismanagement. There was an absence of proper development or prospecting at the former mine, while at the latter the expensive plant was erected before proper ore reserves had been blocked out, and the probability is that, run on a reasonably small scale, there may yet be a considerable amount of gold produced in this mine.

* * * *

Phthisis and the Accident Rate.

Perhaps the most noteworthy passage in the annual report of the Government Mining Engineer is that in which he deals with phthisis and the accident rate. It is satisfactory to find that the Rand accident rate was 3·9 per thousand, as against 4·10 for 1911. The chief reasons for the continued high accident rate are given as: " Bad health conditions; speeding up to secure a large output; anxiety to reduce working costs." The report continues: " Throughout the whole of the Witwatersrand the bad effect of miners' phthisis has now reached its climax. Many of the best miners are dead; others have left, or are leaving before reaching the worst stages of the disease. A general panic has set in, preventing fresh miners from coming to the Rand from oversea. The mines now employ largely second-rate types of miners, of mixed nationality, who are short of the standard of experience and efficiency for dealing with the huge outputs, and for superintending the work of ignorant natives. At the present time attempts to reduce working costs are carried too far. Economies in timbering, packing, pillaring, and other safeguards to underground workers all tend to increase the possibility of accidents." In an addendum to the report, Dr. Van Niekerk, the Mines Medical Inspector, states that the mines and works regulations have made an improvement in working conditions underground by allaying dust. It is a regrettable fact that the men themselves are grossly careless in carrying out the provisions laid down for their safety, but the policing of the mines by inspectors and the mine staff, and the subsequent fining of the delinquents, is having a good effect. Since this report was written, considerable improvement has been made in several of the directions named.

The Droogveld Diggings.

The Droogveld diggings on the property of the New Vaal River Diamond and Exploration Company are now attracting a large number of diggers, and it is reported that the majority of these are " finding " very well. It is indeed reported that one digger has recently discovered 169 stones weighing 294 carats and valued at about £8 per carat. There are said to be some 400 diggers on the fields and about 3,000 natives, the majority from the Kuruman district. From time to time one hears of new discoveries along the river and also of the resuscitation of some comparatively old field. Apparently Droogveld is the most brilliant star in the Barkly West constellation of diamond diggings at the present, and if reports be true most of the men at work there are engaged on the exploitation of very rich " runs " of ground. The Droogveld digging lies in an " elbow " of the Vaal River. At different times individual diggers have made substantial fortunes on Droogveld, and an experienced digger who has had long experience on the river has expressed the opinion to us that the treatment meted out by the proprietary company to diggers is very fair and just. The three farms of the company—Than, Mozib, and Droogveld—have a combined area equal to about 60,000 acres, with frontage of about 27 miles on the Vaal River. A field for alluvial diamonds was thrown open July, 1902. The company is entitled to royalty on production of diamonds, claim licences, stand licences, grazing rights, participation of profit with company's diggers, etc. For the year to June 30, 1911, 18,698¼ carats, value £106,650, or 114s. per carat, were secured, and the royalty to the company was £10,211. After writing off £4,587 for depreciation, the profit for the year was £3,474, and the unappropriated profit at June 30, 1911, was £17,326. For the year to June 30, 1912, 17,918¾ carats, value £106,681, of 119s. 1d. per carat, were secured and the royalty to the company was £10,573. The unappropriated profit at June 30, 1912, was £21,759.

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Cape Colony and Prospecting.

There is very little prospecting work being carried out in the Cape Province, according to the annual report of the Mines Department. Mr. Welsh, the Deputy-Registrar of Claims at Mafeking, and Mr. Stewart, the Deputy-Registrar at Kuruman, report that work in their districts is slack. Some work, however, is being carried out in Namaqualand, where some discoveries of minerals have been reported. An expedition has been granted permission to proceed to the Kalahari Game Reserve to carry out prospecting operations for a diamond mine on behalf of the Government. The expedition has been long delayed owing to the drought, but expects to start as soon as the rains commence. The mining for precious minerals in the Cape Province is practically at a standstill, as no work is being done either in the Mafeking or Prince Albert districts. In the Mafeking district the syndicates which have been carrying out work have been shut down for some considerable time owing to lack of capital, and there appears to be no immediate likelihood of any work being done at present. In the Prince Albert district no work is being carried out, and the Prince Albert Gold Fields, Limited, which was the holder of some 180 reef claims, has been placed in liquidation, and the claims were sold by public auction in October, 1912, for £13. The Deputy-Registrar of Claims at Knysna, Mr. Cloete, reports that no progress has been made at the Millwood Goldfields. He states that the Forest Creek Gold Dredging Company, referred to in his last report, has turned out a failure, and has closed down after two very bad wash-ups; that no work has been carried out for the last eight months, and that he understands that the company is going into liquidation. The Deputy-Registrar reports that very little work has been done on the Bendigo property. A little alluvial digging is in progress, and the gold return for the last year was only about 30 ounces.

Return on Rand Capital.

In the discussion of the amount of profits earned and dividends paid by mines, reference is frequently made, according to the object of the speaker or writer, to the smallness or largeness of the return on the capital invested in South African mines. In his annual report, the Government Mining Engineer points out that in all these references it seems to escape notice that in addition to dividends, there is another and very substantial amount that must be included as part of the return on capital invested, viz., the interest on and the redemption of debentures and to the repayment of loans. These are equivalent to dividends which also are intended to cover interest and amortisation on the amount invested in them. In the case of the Witwatersrand mines, for example, £7,960,394 were paid in dividends during 1912, but an additional amount of approximately £600,000 was also paid as interest on and redemption of debentures, and a further amount of about £800,000 appears to have been disbursed as repayment on loans and temporary advances with the interest due thereon. It is therefore not correct, though frequently done, to calculate costs as the difference between revenue and dividends. Profits tax and similar items may legitimately be classed in a certain sense as costs, but interest and redemption on debentures and loans cannot be so regarded when dealing with the industry as a whole.

* * * *

The Problem of Unemployment.

With the restriction of operations consequent on the shortage of native labour, the problem of unemployment daily grows more serious along the Reef. The closing down of the work on the section of the New Kleinfontein served by the Orient shaft threw a score of men out of work this week, and the stoppage of development in the deep levels of the E.R.P.M. has affected an even larger number of men. Moreover, there are persistent rumours to the effect that the Jupiter is about to close down, preparatory to amalgamation with a neighbouring property. It is thought probable, however, that the directors will be slow to accentuate the prevailing depression or to add to unemployment by taking such a drastic step at this juncture. It is generally reported from the recruiting districts that the natives are again coming forward satisfactorily. This is, perhaps, more particularly true of the Northern Transvaal. As regards the Cape Colony, it is hoped that the mission upon which Mr. H. M. Taberer started out this week, viz., to explain the meaning of the strike to the natives, will be attended by success. No efforts are being spared by the Native Recruiting Corporation to accelerate recruiting, with what success the next few months will show.

* * * *

Gold Fields Rhodesian Meeting.

As was to be expected, Lord Harris, as chairman of the Gold Fields Rhodesian Development Company, tried to afford some encouragement to the shareholders of that undertaking and the holders of other Rhodesian mining shares. While he could not foreshadow the payment of a dividend this year by the Gold Fields Rhodesian, he said he hoped that dividends might be received next year from the Shamva and Golden Kopje mines, and there might then be the possibility of a distribution by the parent concern. The company having insufficient liquid capital to meet the requirements of the developing sub-companies, should these companies be unable to raise funds themselves, arrangements have been made to obtain money from the Consolidated Gold Fields, which Lord Harris described as "the fairy godmother." In course of the discussion the suggestion was made that a company should be formed to buy shares with the object of defeating bear tactics, but Lord Harris, in reply, said he would want to be excused from being on the board of such a company, because he foresaw complications and jealousies, a difficulty of always knowing when to buy and when to sell, "and possibly sometimes an indisposition to give that full information which would be absolutely essential if the board is to conduct successful operations."

TOPICS OF THE WEEK.

THE TRUTH ABOUT PHTHISIS.

THE attempt made by the Federation of Trades to drag in and antedate the phthisis evil as the cause of the recent strike has very properly been nailed to the counter as a gross falsehood by the Chamber of Mines. The statement issued by the Chamber shows very clearly that phthisis played no part whatever in the negotiations preceding the trouble, and makes plain the trick of trying to enlist sympathy for the strike-makers by enlarging upon the evils of phthisis. It would, of course, be churlish to refuse sympathy to the actual sufferers from the disease, but that does not make it any the less necessary to correct recent deliberate misrepresentation of facts and the many gross exaggerations that have been indulged in by the so-called friends of the miner. The Chamber's statement points out that Mr. Kotze, the Government Mining Engineer, gave it as a considered expression of opinion that the phthisis evil was well in hand, and that the mines were no longer unsuitable for young Africanders. The opinion of that authority has been questioned in some quarters, and it is even alleged that Mr. Kotze did not mean all that the Chamber has read into his statement. On turning to the evidence given by Mr. Kotze, on the occasion referred to by the Chamber, we find that he left no possible room for doubt by repeating and emphasising the view quoted by the Chamber, as is shown by the following extract from the minutes of his evidence taken before the Select Committee on European Employment and Labour conditions:—

> Do you think that the scare about miners' phthisis is a real scare?—Certainly.
>
> Is there any justification for the scare?—I think there is justification for it, but to-day I think we are suffering from the results of the past. I say that a man going into a mine to-day need have no fear of getting miners' phthisis in the same way that he had two years ago.

This, it will be seen, coincides with the opinion expressed by the Secretary for Mines in his annual report for 1912, issued this week. In this he says the monthly reports of the inspectors show an immense improvement in the ventilation and the allaying of dust in the mines of the Witwatersrand, and it is safe to say that in many mines visible dust has almost entirely disappeared. Before the same Committee, Dr. L. G. Irvine, the well-known authority on miners' phthisis, in reply to a question from Mr. Merriman, said:—"As far as the conditions of life underground are concerned, we may take it as certain that they are improving, and improving very steadily. The Government, as you know, has appointed the Miners' Phthisis Prevention Committee, which is composed of the Government Mining Engineer, and a large number of mining engineers, managers and consulting engineers, and a certain number of medical men, and they are conducting a very large and thorough and logical series of experiments on the mines, in regard to the measures which are necessary to combat miners' phthisis, chiefly by allaying the dust and by ventilation. They are doing very good work, and they have already issued an interim report, and as a result of that, I think you will find the mining regulations will be improved and extended and made more strict and more thorough in detail than they are. I think we may take it for granted that the conditions underground will soon be made as good as they can be made by the joint action of the Government and the mining community." Against these opinions of the best-informed experts we have nothing to set but the hysterical outbursts of demagogues who are eloquent in proportion as they are ill-informed. In the course of the evidence given by Mr. J. T. Bain of strike fame, this fact came out very clearly. After this labour leader had indulged in a characteristic tirade against health conditions on the mines, admittedly based entirely on hearsay, the following illuminating dialogue took place between him and the Chairman:

> Chairman: Do you speak with any knowledge of the conditions now prevailing on the mines?—I have not worked except on the diamond mines lately.
>
> Do you know the conditions are very much changed?—I know they are changed.
>
> Then you must not declaim against them as if nothing had been done. We have made it our business to try and do something.—I know a considerable amount has been done.
>
> Why do you come and declaim in the most violent manner without knowing what we have done—what the Government has done and what the mine owners have been doing?—They have done something, I know.
>
> They have been doing a great deal.—I put it clearly that I was speaking from second-hand information.
>
> You enter on a line of violent declamation against this thing, and you do not know what is being done at the present time.

This sort of evidence weighed against that of the Government Mining Engineer and the medical experts, points its own moral. Unfortunately, the public being unversed in the laws of evidence cannot always discriminate between the conflicting opinions on both sides, and they are often influenced by the easy eloquence of the arm-chair critics of the industry. Since the strike leaders now refuse to give evidence before an industrial commission of inquiry, it may be concluded from an examination of the evidence given by them in Capetown previous to the strike that they fear again to submit their fantastic and exaggerated views to the stern ordeal of public cross-examination.

NEW PATENT LAW FOR THE UNION.

Owing to the extraordinary rush of legislation that marked the closing days of the last session, the draft Bill to Consolidate the Laws dealing with Patents and Designs within the Union had, with others, perforce to be shelved. The delay has served a purpose in giving time to the leading patent agents to examine the provisions carefully and to prepare a list of emendations for submission to the Government before the Bill becomes law, and these we hope to deal with at some future date. In the main, however, expert opinion agrees that the proposed measure is quite satisfactory. It is noteworthy that the definition of a patent is framed upon the lines of the one in force in the Transvaal, which has been found to work well in practice, it being specially provided, however, that the grant of a patent in a foreign country shall not debar the grant of a Union patent to the same person, if he applies in the ordinary way within twelve months. That is a provision which the Commissioners who framed the Bill recommend as equitable and just, and which has also been in practical working in the Transvaal for more than ten years. The important question of principle in connection with the Patents Bill has relation to the manner in which applications shall be dealt with at the central office. Should a strict official examination as to novelty be instituted, as is done in Germany and America, and no letters be issued in respect of applications which have stood the test of such an examination; or should the Patent Office refrain from any guarantee express or implied as to novelty, and a full opportunity of attack at a later stage be afforded to interested persons whose rights the grant would prejudice? The weight of expert opinion upon this point, considered as an abstract question, would seem to favour the examination system. On the other hand there are objections to it which merit consideration. The power of an official examiner in regard to the restriction of claims and the refusal of patents is difficult to control, and may be arbitrarily exercised. But it is not necessary to discuss the merits of the question, because the Commissioners responsible for the Bill are satisfied that it is not practicable in the present circumstances of the country to adopt such an examination system. They say that to be of use, the investigation must be effective; an incomplete examination as to novelty would be worse than none at all, for it would induce a false sense of security not warranted in fact, and would result in the frequent rescission of grants which had received the imprimatur of a State department. But an effective examination would necessitate not only a large staff of highly trained experts, but a mass of material in the way of indices, abstracts and scientific records and books which is at present practically unattainable. The Commissioners recommend therefore that the office should not be compelled to undertake an examination as to novelty. The points on which the Commissioner is required to satisfy himself are detailed in the Bill; but he is not confined to these points and the fact that the statutory definition of an invention does not include an alleged invention obviates any danger that he may consider himself compelled to accept an application which relates to a device or a process clearly not patentable. It is obvious, however, that even under the procedure which is recommended the investigation work thrown upon the Commissioner may become very heavy, and that skilled assistance may be desirable. Provision has therefore been made for the appointment of one or more examiners to assist the Commissioner; such examiners are given a statutory status in regard to the investigations of applications. If any are appointed the Commissioner may avail himself of their services; if not, he performs the work himself. The application, having been accepted, is in due course to be advertised, and it is at this stage that the Commissioners think that full opportunity should be given to interested persons to prevent the sealing of Letters Patent, if there are good reasons why they should not issue. They have accordingly made the grounds of objection as wide as possible, instead of limiting them as in England. This will enable any member of the public interested in the matter to crush a "non-novel" patent by opposition proceedings before it is issued, instead of being compelled to wait until he could set up a defence to an infringement action, or institute proceedings for revocation. This procedure has answered well in the Transvaal, and in the opinion of the Commissioners it should be adopted throughout the Union. So much for the main features of the measure. A point of practical importance is the fact that the Bill can hardly become law before a year, and that a further period must elapse before the new machinery to apply it can come into being. By that time the various minor shortcomings of the measure will doubtless have been rectified.

ARE MINING REPORTS PUBLISHED TOO FREQUENTLY?

The Question Revived—Brakpan Mines Development and its Bearing on the Matter.

That the auriferous conglomerate beds of the Witwatersrand, although remarkably consistent in value over large stretches, evidence considerable fluctuation in gold contents in different properties and during different periods needs no elucidation.

Improving Conditions at Brakpan.

In the last issue of this journal there appeared an article on the Brakpan Mines in which it was shown that development results have recently improved. Furthermore, it was shown that in a mine laid out in the manner of the Brakpan property with two dip shafts there is a greater liability of all development faces being simultaneously in good or bad ore as the case may be, than with shafts located along the strike. An examination of the development results at Brakpan quarter by quarter discloses the fact that up to the end of July last 50,075·5 feet had been driven, sunk and risen on reef. The average widths and values over this footage were 34·847 ins. and 8·491 dwts. Expressed in terms of inch-dwts. (that is, width multiplied by value), the average up to the end of last month was 295·9. The July development only disclosed 184·3 inch-dwts., but so satisfactory have the latest widths and values in the south incline and on the thirteenth level been that it is quite likely the August development will to a large extent retrieve the poor disclosures of July. To better appreciate the development position in this mine to date, a detailed schedule is appended which should repay study.

Brakpan Developments to Date.

Results since commencement of work have been:—

Period.	Footage on Reef.	Reef Width. Inches.	Reef Width. Dwts.	Dwt.-Ins.
End 1908	2,297·5	27·8	9·95	276·6
31st Mar., 1909 ...	1,367·5	47·78	7·23	345·4
30th June, 1909 ...	2,092·5	44·61	7·30	325·6
30th Sept., 1909 ...	1,026·0	28·40	5·97	169·5
31st Dec., 1909 ...	1,767·0	24·50	9·10	222·9
For year	6,253·0	36·96	7·45	275·3
To date	8,550·5	34·60	8·00	276·8
31st Mar., 1910 ...	2,675·0	24·4	7·6	185·4
30th June, 1910 ...	3,255·5	35·6	8·7	309·7
30th Sept., 1910 ...	3,501·5	35·0	7·6	266·0
31st Dec., 1910 ...	1,804·5	36·6	7·2	263·5
For year	11,236·5	32·91	7·87	259·0
To date	19,787·0	33·6	8·0	268·8
31st Mar., 1911 ...	3,239·0	28·0	9·6	268·8
30th June, 1911 ...	3,390·5	33·7	10·26	346·0
30th Sept., 1911 ...	1,411·0	31·5	10·30	324·4
31st Dec., 1911 ...	1,674·0	42·1	10·20	429·4
For year	9,714·5	32·93	10·06	331·3
To date	29,501·5	33·3	8·675	288·8
31st Mar., 1912 ...	1,563·0	42·7	8·7	371·5
30th June, 1912 ...	3,173·5	41·9	8·7	364·5
30th Sept., 1912 ...	3,953·0	36·3	10·8	392·0
31st Dec., 1912 ...	3,930·0	33·9	8·8	298·3
For year	12,619·5	37·75	9·36	353·3
To date	42,121·0	34·7	8·895	308·6
31st Mar., 1913 ...	2,615·0	37·6	7·8	293·3
30th June, 1913 ...	4,365·0	35·7	5·67	198·8
For half-year ...	6,980·0	36·02	6·5	234·1
To date	49,101·0	34·89	8·544	298·1
July, 1913	974·5	32·67	5·64	184·3
To date	50,075·5	34·847	8·491	295·9

The Case for Annual Reports.

The foregoing table sets forth clearly the fluctuating fortunes of the proposition in regard to development. It shows that although for the first quarter of this year the average value of development, payable and unpayable, was lower than for last year, it was better than it was for the first three and a half years of the mine's history. For the second quarter of the current year the average was still lower, but compares favourably with a former period of nine consecutive months. It must be borne in mind that a few years ago the mine was necessarily not so well opened up as at present, and that therefore the chances are in favour of the present phase being passed through in a comparatively short time. There is therefore nothing that need be construed as disconcerting in the position, having regard to the usual irregularities in development peculiar to the mines of the district. In connection with these figures the subject of the frequency of issue of Rand reports and the periods which they cover has been revived. We have discussed this aspect of Witwatersrand mining in several issues, but the case of Brakpan tempts one to again give the matter consideration. Not a few leading men connected with the industry contend that the publication of reports with the frequency pursued on the Rand is as liable to be detrimental to shareholders' interests as it is likely to be beneficial. To take the case of the Brakpan Mines, for example. Sensational rumours were afloat the other day regarding this property, and it was freely stated, to use alarmist phraseology, that the "bottom had fallen out of the mine." The report for the quarter ended with June last, which disclosed 4,365 ft. of development, giving only 5·67 dwts. over 35 inches, assisted in the propagation of a pessimistic view, and the shares were unduly depressed. Now, however, reef disclosures are so much better there seems a reasonable chance of the development results for the whole current year being satisfactory. It may be asked, therefore, and with some reason, would it not be better from the shareholders' point of view to state development results over a lengthier period than a single quarter, in which period exceptionally low or exceptionally high results quite unrepresentative of the average of the mine might be obtained? In other words, "would it not be more conducive to the maintenance of stable market conditions and a more proper comprehension of the prospects and value of the mine if development results were only published over a lengthier period than a quarter, say, at the least six months?"

The Other View.

Similar arguments have been used in regard to publication of statistics as to production, but the disciples of the annual report doctrine have a great array of interested and disinterested public opinion to fight. Rightly or wrongly, the more prevalent view is that suppression of mining and milling results for a year would open the door to abuses in the direction of market manipulation and would result in a grave feeling of suspicious ignorance amongst shareholders. In regard to the development figures for Brakpan one can see some justification for the view that less frequent publication of reports is desirable. But we could mention another Rand mine where development has been consistently bad throughout the year, and unlike Brakpan there is no indication of improvement. What would shareholders say at the end of the year if they were then first acquainted with an unsatisfactory state of affairs extending over twelve months? Technical mining men argue that the publication of monthly and quarterly reports would in every way be desirable if shareholders had sufficient technical knowledge to appreciate the position of development at the end of different periods. But, they argue, shareholders in the vast majority of cases lack such knowledge and are liable to damage their own interests by jumping at hasty conclusions derived from reports covering restricted periods. Without expressing any definite views one way or the other, we think that reference to this matter is interesting and worth making, the more especially as the development position at Brakpan seems to bear very particularly on the subject.

THE LOT OF THE RAND MINE WORKER.

A Special Enquiry into the Conditions of Life and Work along the Reef.

I.—RATES OF WAGES AND COSTS OF LIVING AT FOUR REPRESENTATIVE MINES.

As promised in our last issue, we this week commence a series of articles on the lot of the Rand mine employee. Clearly there is a tremendous amount to be written on this subject which is so much in the limelight at the present, but it is hoped that by the time these articles have been brought to a conclusion most of the essential details concerning the life of employees on these fields will have been covered. The first subjects of the enquiry we propose to institute are in regard to wages and the costs of living. In two or three recent issues we have given figures of average payments along the whole Witwatersrand. These have been abstracted from the Government reports of the Mines Department, and it must have been obvious to all who gave them consideration and who contrasted the average payments per shift for different classes of labour on the Rand and in other mining fields that the local wages are comparatively high, in fact very high. Public opinion calls, however, for a further enquiry into wages, and to satisfy critical curiosity on this point we have obtained the official pay sheets of four leading mines under the control of the Central Mining and Investment Corporation for the month of June this year. Before leaving for a while the question of average wages for the whole field, it will be of interest to correct an impression that the tendency on the Witwatersrand is to reduce wages year by year so that the payments to employees to-day are not nearly so large as they were a few years ago, and especially so before the Boer War. Reference to that excellent book, "The Gold Mines of the Rand," by Messrs. Hatch and Chalmers, published in 1895, throws much interesting light on this subject. The authors drew on the publications of the State Mining Engineer for figures as to salaries, and it is interesting to find that they then wrote:—"The class of white labour available on the field is improving yearly, as might be expected when the inducements offered are considered. The climate is excellent, the fields are of proved permanence, wages are good, and there is a further inducement in the conditions of work, the amount of manual labour falling to the lot of the white hands being reduced to a minimum, owing to the employment of natives. The wages paid for various classes of skilled labour are as follows:—Miners, 14s. to 15s. a shift; rock drillmen, £1 a shift or contract; mill hands (senior), £25 to £30 a month; mill hands (junior), £20 to £25 a month; engine-drivers, 14s. to 18s. a shift; fitters, 15s. to 20s. a shift; carpenters, 15s. to 20s. a shift; blacksmiths, 15s. to 20s. a shift. General hands, with no particular trade, or learners, may earn from £10 to £20 a month."

It would seem then that despite the great reduction in the cost of living which has resulted from more established economic conditions as between 1894 and to-day wages have not been reduced. On the contrary, the majority of the mines along the reef pay higher wages to-day than those noted above. For purposes of studying closely the payments to employees we have obtained the pay sheets of the Crown Mines, the Modderfontein B., the Village Deep and the Rose Deep mines. These four propositions were not specially selected. They were singled out as being a representative quartette of properties under the control of the Central Mining and Investment Corporation. We asked, however, for full details as to wages paid at the Crown Mines, since it is popularly alleged that the payments to employees by this company are poor and compare unfavourably with the payments of the majority of other mines on the Witwatersrand. As to the three other properties, the Modder B. is representative of a new and shallow Further East Rand mine, the Village Deep is representative of a comparatively new Central Rand deep deep level proposition, whilst the Rose Deep is typical of a long-established East Rand low grade, first row, deep level property. Summarised, the rates paid by these four mines in the month of June were:—

	Below Ground.		Above Ground.		Below and above Ground.	
	No. of Men.	Average Rate per Shift.	No. of Men.	Average Rate per Shift.	No. of Men.	Average Rate per Shift.
		s. d.		s. d.		s. d.
Crown Mines	671	17 5	560	15 11	1,231	16 8
Village Deep	210	21 9	183	17 0	393	19 6
Modder B.	164	19 11	120	16 10	284	18 7
Rose Deep ..	236	17 11	214	16 5	450	17 2

Taking the first-mentioned property it will be of interest to enquire into the wages paid for different branches of work. Details of number of men employed, number of shifts worked, the average rate paid per shift and the highest and the lowest rates are as under:—

Crown Mines.

CLASS OF WORK.	Average No. of Men.	No. of Shifts worked.	Average Rate per Shift.	Highest Rate per Shift.	Lowest Rate per Shift.
UNDERGROUND.—					
Shaft Timbering and Equipment	19	506	20/3	25/-	15/-
Other Timbering ..	63	1,647	16/6	22/6	10/-
Other Timbering Contract	1	23	42/6	42/6	42/6
Other Timbering Learners	5	133	9/1	12/6	5/-
Rockwallers	45	1,150	10/6	20/-	7/6
Rockwallers, Learners ..	4	107	9/-	10/-	8/-
Stope Filling	7	171	20/4	22/6	20/-
Platelaying	19	494	17/-	22/6	10/-
Truck Repairers ..	2	49	15/7	16/-	15/-
Tallymen	4	100	7/2	8/6	5/-
Shaking Chute Attendants	3	68	12/1	13/4	10/-
Electric Loco Drivers ..	5	131	18/5	22/6	12/6
Electric Loco Conductors	4	98	10/-	10/-	10/-
Petrol Loco Drivers ..	4	104	17/1	18/4	16/8
Pumpmen	8	245	15/10	20/-	12/-
Switch Board Attendants	1	30	7/6	7/6	7/6
Underground Crusher Attendants	1	26	12/-	12/-	12/-
Underground Drill Packers	5	141	9/-	12/6	7/6
Sanitation Overseers ..	4	99	15/11	22/6	11/-
Drain & Track Cleaners	6	152	10/10	13/4	10/-
Pipefitters on Air Mains	14	355	18/-	20/-	10/-
Water Service	7	186	15/4	20/-	10/-
Skipmen and Onsetters ..	43	1,146	14/5	18/4	7/6
Electric Winding Engine Drivers	9	256	20/3	22/6	15/-
Electric Winding Engine Learners	2	51	5/6	6/-	5/-
Winch Attendants in Stopes	6	155	7/1	12/6	6/-
Winch Attendants in Shafts	4	117	16/2	20/-	8/-
Acting Shift Boss ..	1	27	20/-	20/-	20/-
Underground Fitters ..	3	85	20/10	22/6	20/-
Shovelling and Tramming Gangers	81	1,973	11/8	20/-	6/-
Shovelling and Tramming Learners	3	71	8/-	8/-	8/-
Drill Sharpening Foremen	1	26	27/6	27/6	27/6
Drill Sharpening Contract	14	383	27/3	27/3	27/3
Drill Sharpening Day's Pay	5	123	21/6	25/-	15/-
Drill Sharpening Apprentice	1	23	12/-	12/-	12/-
STOPING.—					
Hand Contract	16	407	33/5	65/11	Nil.
Hand Day's Pay	68	1,692	16/6	20/-	10/-
Large Machine Contract..	41	1,010	29/11	99/6	Nil.
Large Machine Day's Pay	13	334	18/6	20/-	12/6
Large Machine Learners..	30	733	9/-	15/-	3/6
Small Machine Contract..	49	1,222	28/5	78/9	Nil.
Small Machine Day's Pay	5	119	16/4	25/-	13/4
Small Machine Learners..	4	87	10/-	12/6	5/-
DEVELOPING.—					
Shaft Sinking Hand Day's Pay	2	61	25/-	25/-	25/
Shaft Sinking Hand, Day's Pay and Bonus	2	63	30/3	30/3	30/3

CLASS OF WORK.	Average No. of Men.	No. of Shifts worked.	Average Rate per Shift.	Highest Rate per Shift.	Lowest Rate per Shift.
Shaft Sinking Hand, Large Machine, Contract	2	48	15/-	15/-	15/-
HAND CONTRACT :—					
Hand, Day's Pay ..	9	225	18/5	22/6	15/-
Large Machine Contract ..	6	162	30/1	86/-	12/4
Large Machine Day's Pay	3	72	17/6	20/-	12/6
Large Machine Learners ..	9	212	11/1	15/-	10/-
Small Machine Contract ..	4	116	27/4	55/6	14/1
Small Machine Day's Pay	3	74	18/10	20/-	16/8
Small Machine Learners ..	1	25	15/-	15/-	15/-
Total Underground	671	17,113	17/5	—	—
SURFACE :—					
SORTING AND CRUSHING.—					
Sorting Overseers ..	4	110	19/6	20/-	19/-
Crushing Overseers ..	4	117	20/-	20/-	20/-
Fitters	2	65	20/-	20/-	20/-
Sorting, Unskilled	3	75	6/11	10/-	3/6
Waste Dump Overseers ..	2	55	15/-	15/-	15/-
REDUCTION.—					
Amalgamators	35	893	17/10	18/6	15/8
Assistant Amalgamators ..	26	772	14/9	16/8	12/6
Stamp Mill Learners ..	28	859	8/7	12/6	7/6
Tube Mill Learners ..	8	249	8/7	10/-	7/6
Cyanide Learners ..	11	348	10/-	10/-	7/6
Tankamen and Excavator Drivers	19	579	14/9	22/6	10/-
Extractor House	9	295	17/1	17/6	16/8
Tube Mill Fillers	9	262	15/2	16/8	15/-
Slimes Dam Attendants ..	2	61	12/-	14/-	10/-
Butters' Filter Process ..	3	91	14/2	15/-	12/6
Millwrights & Fitters ..	10	292	19/4	21/-	10/-
Cyanide Fitters	6	175	20/2	23/4	15/-
Mill Engine Drivers ..	5	150	20/-	20/-	20/-
Mill Engine Drivers, Learners	3	89	5/-	5/-	5/-
AIR POWER.—					
Compressor Drivers ..	2	59	20/-	20/-	20/-
Air Meter Attendants ..	10	294	5/6	7/6	5/-
Reduction Motor Attendants	3	90	10/-	10/-	10/-
STEAM POWER.—					
Boiler Cleaners, Fitters, etc.	4	116	19/4	22/6	15/-
Firemen	11	331	16/3	18/4	12/-
Learners (firemen) ..	3	88	5/-	5/-	5/-
COMPOUND.—					
Night Guards	3	90	7/6	7/6	7/6
Food Attendants	1	30	10/-	10/-	10/-
Change House Attendants	3	90	10/-	10/-	10/-
Assay, Learners	2	50	7/6	7/6	7/6
Smelting, Learners ..	1	32	10/-	10/-	10/-
WORKSHOPS.—					
Foremen	5	150	23/2	25/-	22/6
Drill Sharpening, Day's Pay	8	210	18/7	25/-	12/6
Drill Sharpening, Contract	10	243	24/	25/7	23/4
Smiths	13	328	20/2	22/6	20/-
Fitters	48	1,272	20/-	20/-	20/-
Boilermakers	16	411	20/-	20/-	20/-
Truck Repairers ..	2	51	16/3	17/6	15/-
Carpenters	32	840	20/	20/-	20/-
Patternmakers	3	78	20/10	22/6	20/-
Painters	3	76	18/5	20/-	15/-
Masons	9	242	20/10	22/6	20/-
Plumbers	2	50	20/-	20/-	20/-
Electricians	15	417	20/-	20/-	20/-
Riggers	8	235	21/-	23/4	20/-
Handymen	8	201	13/3	16/8	8/6
Improvers	10	259	12/1	15/-	6/-
Foundry	3	75	18/-	20/-	14/
Learners	4	102	11/9	17/-	6/-
Apprentices	30	753	6/1	10/-	3/-
WATER SUPPLY.—					
Pump Attendants ..	2	59	13/4	13/4	13/4
GENERAL SURFACE.—					
Surface Transport ..	13	424	16/6	20/-	10/-
Surface Police	5	146	13/7	15/-	12/-
Caretakers	2	60	11/8	13/4	10/-
Surface Overseers' Assistants	3	78	15/7	18/4	13/4
Gardeners	3	83	15/3	16/8	14/-
Draftsmen, Assistant ..	1	25	12/-	12/-	12/-
Banksmen	16	464	13/9	16/8	10/-
Change House Watchmen ..	6	174	9/7	12/6	7/6
Stope Filling	2	50	18/9	20/-	17/6
Steam Winding Engine Drivers	19	591	21/8	22/6	15/-
Electric Winding Engine Drivers	18	545	22/6	22/6	22/6
Electric Winding Engine Drivers, Learners ..	4	127	7/6	7/6	7/6
Air Winch Drivers ..	2	60	20/-	20/-	20/-
Drill Packers	3	80	5/10	8/-	4/-
Total Surface ..	560	15,766	15/11	—	—
Total Underground ..	671	17,113	17/5	—	—
GRAND TOTAL ..	1,231	32,879	16/8	—	—

It will be observed that at the Crown Mines a larger number of learners and apprentices are employed than at the other mines, and this has the effect of reducing average wages throughout the property. The rates given above would admit of further segregation according to the number of men earning over £100 per month, between £80 and £100 per month, and so on, but as the examination of pay sheets makes such a heavy call on space this further classification, although we fully recognise its value, is not here attempted. Rates of pay at the Village Deep are higher than at the Crown Mines. An analysis of the June pay sheet gives the following figures:—

Village Deep.

CLASS OF WORK.	Average No. of Men.	No. of Shifts worked.	Average Rate per Shift.	Highest Rate per Shift.	Lowest Rate per Shift.
UNDERGROUND.—					
Hand Shaft Sinking ..	2	47	114/2	114/7	113/8
Machine Developing ..	18	442	47/4	81/10	17/7
Hand Developing (including Reclaiming) ..	2	52	20/-	20/-	20/-
Hand Stoping (including Reclaiming)	8	214	30/4	46/8	16/8
Maching Stoping	21	543	34/8	96/-	12/10
Machine Learners ..	9	217	4/3	5/-	4/-
Machine Helpers	4	94	10/10	20/-	6/3
Tramming	30	770¼	17/3	22/-	5/-
Timbering	28	790¾	19/6	20/-	12/6
Waste Packing	16	398	9/10	15/-	7/6
Skipmen	13	371½	15/9	20/-	12/6
Onsetters	5	144½	14/5	15/-	12/6
Winch Drivers	8	209	10/5	13/4	8/-
Dense-air & Incline Hoists	5	163¾	21/1	22/6	20/-
Drill Collecting	2	51	17/10	26/-	10/-
Shaft Maintenance ..	9	302½	21/8	25/-	20/-
Sanitation	1	25	15/-	15/-	—
Water Service	7	173	12/15	20/-	10/-
Pipe Fitters	7	175	18/6	22/6	16/8
Pumpmen	5	148	19/5	22/6	16/8
Ventilating Fan	2	49½	15/-	15/-	15/-
Kimberley Chute	2	53	7/6	7/6	7/6
Platelayers	3	76	20/-	20/-	20/-
Fitter	1	23⅞	22/-	22/-	—
Shift Bosses	2	50	26/-	26/-	26/-
Totals and Averages ..	210	5,583½	21/9	—	—
SURFACE.—					
Sorting	5	144	3/6	4/-	2/6
Crushers	2	64	14/5	16/8	12/6
Transport	3	90	9/6	16/8	5/-
Mill Amalgamators ..	6	183½	20/-	20/-	20/-
Mill Amalgamators Assistants	6	179½	15/-	17/6	12/6
Mill Learners	3	76	7/6	7/6	7/6
Tube Mill Amalgamators	2	62	17/6	17/6	17/6
Tube Mill Amalgamators, Assistants	2	69½	10/-	10/-	10/-
Tube Mill Shiftsmen ..	3	102	15/-	15/-	15/-
Cyanide Learners ..	2	51½	8/10	10/6	7/6
Extractor House Shiftsmen	3	93	18/6	20/-	16/8
Sands Tanks	3	88	12/2	12/6	12/-
Slimes Shiftsmen	3	109½	16/10	19/-	16/-
Mill and Cyanide Fitters ..	2	61	20/-	20/-	20/-
Millwrights	2	57½	20/-	20/-	20/-
Boiler Attendants ..	6	181½	17/9	22/6	15/-
Engine Drivers	16	482¾	21/11	22/6	20/-

CLASS OF WORK.	Average No. of Men.	No. of Shifts worked.	Average Rate per Shift.	Highest Rate per Shift.	Lowest Rate per Shift.
Compressor Drivers	2	49½	20/-	20/-	20/-
Muddy Water Pumps	3	90	12/-	12/-	12/-
Blacksmiths	5	132	20/9	23/6	20/-
Boilermakers	8	224¼	20/4	22/6	20/-
Drill Sharpeners	18	450	25/9	29/6	25/6
Fitters	15	406¾	20/8	25/-	20/-
Riggers	4	120¼	20/5	21/6	20/-
Handymen	2	51¾	12/7	15/-	10/-
Electricians	5	142½	20/7	22/6	17/6
Carpenters	8	217½	20/9	25/-	20/-
Painters	2	49¾	16/8	16/8	16/8
Plumbers	1	25	20/-	20/-	—
Masons	4	105	20/-	20/-	20/-
Apprentices	15	375½	4/3	8/-	1/6
Gardener	1	25	16/-	16/-	—
Caretaker	1	30	17/6	17/6	—
Night Watchman	1	30	15/-	15/-	—
Gate-keepers	2	60	12/6	12/6	12/6
Telephone Operator	1	30	5/-	5/-	—
Engineer's Clerk	1	25	17/6	17/6	—
Coachman	1	30	12/6	12/6	—
Compound Guards	2	60	11/3	12/6	10/-
Hospital Attendant	1	30	10/-	10/-	—
Banksmen	6	186½	16/4	16/8	15/-
Change House Attendant	1	30	12/6	12/6	—
Timbermen	2	58	20/-	20/-	20/-
Drills and Stores	2	50	12/6	15/-	10/-
Totals and Averages	183	5,179½	17/-	—	—

Modder B.

At the Modder B. the June rates of pay were as under:—

Class of Work.	No. of Men.	No. of Shifts. worked.	Average. wage per Shift.	Highest Wage.	Lowest Wage.
Timbermen	8	205	20/7	25/-	15/-
Pipemen	5	138	20/-	20/-	20/-
Fitters (Underground)	2	50	21/3	22/6	20/-
Platelayers	6	141	20/-	22/6	16/8
Drill Carriers	1	23	10/-	—	—
Banksmen and Onsetters	7	195	12/9	16/8	10/-
Skipmen	2	50	18/4	18/4	18/4
Trammers	37	926	13/9	18/4	5/-
Pumpmen	1	30	16/8	—	—
Machine Stoping Contractor	9	213	47/11	57/-	20/-
,, Day's pay	3	69	20/-	20/-	20/-
Hand Stoping Contractor	6	149	25/10	39/10	14/10
,, Day's pay	11	273	18/6	20/-	15/-
Machine Development Contractor	13	327	47/9	69/2	21/3
,, Day's pay	1	25	15/-	—	—
Machine learners	2	54	6/5	7/9	5/-
Shaft sinkers	2	50	25/-	25/-	25/-
Reclaiming	2	49	20/-	20/-	20/-
Waste packing	22	543	16/9	20/-	12/6
Winch drivers	20	500	13/4	18/4	12/6
Sanitation	1	25	12/6	—	—
Underground stables	3	80	14/2	20/-	10/-
Total Mine	164				
Amalgamators	4	113	17/6	17/6	17/6
,, Assistants	5	134	10/-	10/-	10/-
Tube mill shiftsmen	3	86	13/6	13/6	13/6
Mill shiftsmen	3	88	18/6	18/6	18/6
,, Assistants	3	86	9/4	10/-	8/-
Millwright	1	26	20/-	—	—
Fitter	1	26	20/-	—	—
Slimes shiftsmen	3	90	17/6	17/6	17/6
Sands shiftsmen	3	88	17/6	17/6	17/6
Butters Filter	3	87	10/-	10/-	10/-
Smelters	3	80	14/5	20/-	10/-
Cyanide fitter	1	27	20/-	—	—
Total Reduction	33				
Fitters	11	275	20/-	22/6	16/8
Riggers	2	50	20/-	20/-	20/-
Handymen	1	25	17/6	—	—
Boilersmiths	5	115	20/-	20/-	20/-
Plumbers	1	25	20/-	—	—
Painter	1	23	20/-	—	—
Masons	2	50	21/3	22/6	20/-
Carpenters	9	219	20/-	20/-	20/-
Smiths	4	97	18/9	20/-	15/-
Drill sharpeners	9	232	20/-	20/-	20/-
Electricians	5	113	20/4	21/8	20/-
Apprentices	3	83	7/10	10/6	5/-
Learners	7	180	6/7	10/-	4/-
Total Shops	60				
Crusher men	1	25	13/4	—	—
Belt conveyer men	1	30	15/-	—	—
Pump Station Geduld	1	30	20/-	—	—
Firemen	3	73	15/-	15/-	15/-
Watchmen	1	30	15/-	—	—
Engine Drivers	8	225	20/7	22/6	20/-
Compressors	3	71	20/-	20/-	20/-
Winch drivers	9	223	15/4	17/6	12/6
Total Sundry Surface	27				
Grand Total	284				

Rose Deep.

At the Rose Deep the analysis for June gives the following results:—

UNDERGROUND.

Class of Work.	No. of Men.	No. of Shifts worked.	Average wage per Shift.	Highest Wage.	Lowest Wage.
STOPING:					
Hand—Day's pay	7	175	17/6	20/-	16/8
,, Contract	7	167	19/9	32/6	13/6
Large Machine—Day's pay	6	151	20/-	20/-	20/-
,, Contract	26	622	26/7	49/1	16/8
Small Machine—Contract	1	23	21/7	21/7	21/7
Machine learners	6	149	8/2	12/6	7/-
Drill attendants	3	74	11/5	13/4	12/6
RECLAIMING:					
Large machine	5	119½	20/9	22/6	20/-
Small machines	3	73	17/3	18/4	16/8
Hand	19	463	17/5	20/-	15/-
Stope filling	2	48	19/6	22/6	16/8
Stope timbering	18	460	19/7	20/-	16/8
Waste rock walling	19	468	8/5	10/-	7/-
Trammers	22	538	15/5	16/8	12/6
Assistant trammers	9	219	9/11	12/-	7/6
Tracklayers	4	101	19/7	20/-	18/4
Assistant tracklayers and Haulage attendants	5	123	7/11	9/-	7/6
Shakers and truck repairers	4	100	19/2	20/-	16/8
Skipmen	13	372	17/-	18/4	16/8
Banksmen	5	129	17/-	18/4	15/-
Onsetters	2	52	15/10	16/8	15/-
Winch drivers	2	51	12/-	15/-	9/-
Shaft timbermen	11	312	20/8	24/8	20/-
Sanitation	4	97	11/3	12/6	10/-
Drill sharpeners	4	105	22/6	22/6	22/6
Pipe fitters	10	245½	18/10	20/-	15/-
Pumpmen	7	216½	16/6	20/-	15/-
DEVELOPING:					
Large Machine—Contract	5	123	36/1	51/3	21/-
,, Day's pay	1	25	20/-	20/-	20/-
Small Machine—Contract	2	47	38/10	48/3	30/6
,, Day's pay	2	48	20/6	22/6	18/4
Hand Contract	1	25	29/5	29/5	29/5
,, Day's pay	1	25	18/4	18/4	18/4
Totals and Averages	236	5946½	17/11	—	—
SURFACE.					
Crushermen	6	169	17/1	23/-	10/-
Surface trammers	4	106	7/3	7/6	7/-
Mill amalgamators	7	215	18/6	18/7	18/6
Assistant Amalgamators	7	215	15/4	15/9	15/-
Learners	10	317	9/4	10/-	6/-
Millwrights	1	30	19/9	19/9	—
Mill fitter and carpenter	1	28	20/-	20/-	—
Handyman	1	30	15/-	15/-	—
Gatekeepers	2	60	10/-	10/-	—
Tube mill amalgamators	5	154	15/8	15/9	15/8
Assistant tube mill amalgamators	7	232	10/-	12/6	7/6
Extractor housemen	6	190	18/6	18/6	—
Slimesmen	6	186	14/8	15/-	14/4
Tanksmen	2	76	12/-	12/-	—
Cyanide sampler	1	30	13/4	13/4	—
Learners	11	372	7/2	10/-	5/-
Cyanide fitter	1	35	20/-	20/-	—
Slimes dam overseer	1	30	15/-	15/-	—
Boilers	7	218	15/10	18/4	13/-
Electric Winding engine drivers	18	547	21/8	22/6	20/-
Electric mill motors	3	90	20/-	20/-	—
Mill engines (Steam)	2	58	20/-	20/-	—
Various engines (Electric)	5	144	13/-	20/-	7/6
Smiths	4	105	20/-	20/-	—

Class of Work.	No. of Men.	No. of Shifts worked.	Average wage per Shift.	Highest Wage.	Lowest Wage.
Apprentices	2	50	9/-	10/-	8/-
Hand drill sharpeners	2	57	20/-	20/-	—
Machine drill sharpeners:					
Day's pay	3	77	20/-	20/-	—
Contracts	4	100	29/-	29/1	29/-
Boilermakers	8	222	20/-	20/-	—
Truck fitters	3	75	17/9	18/4	16/8
Apprentice	1	25	10/-	10/-	—
Electricians	11	334	20/-	20/-	—
Improver	1	25	15/-	15/-	—
Apprentices	3	77	3/6	4/6	1/6
Masons	6	161	20/5	23/-	19/9
Fitters	13	357	20/3	23/-	20/-
Turners	4	106	20/-	20/-	—
Riggers	2	66	20/-	20/-	—
Plumber	1	25	20/-	20/-	—
Handymen	3	78	16/8	20/-	15/-
Fitters' improver	1	24	12/-	12/-	—
Fitters' apprentices	7	176	5/8	10/-	1/6
Carpenters, etc.	13	342	20/-	20/-	—
Painters	4	99	19/2	20/-	18/4
Change house caretaker	1	30	12/8	12/8	—
Watchman	1	30	16/8	16/8	—
Gardener	1	25	15/-	15/-	—
Transport overseer	1	30	16/8	16/8	—
Totals and Averages ..	214	6228	16/5	—	—

SUMMARY.

	Number of men working (on each class of work).	Number of Shifts worked (on each class of work).	Amount earned.	Average wages earned per shift.
Underground ..	236	5,946½	£5,327 17 1	17/11
Surface	214	6,228	5,123 12 1	16/5
Totals and Averages	450	12,174½	£10,451 9 2	17/2

In each instance the above schedules have reference to white employees for the month of June who worked 23 shifts and over during that period.

These figures have to be considered in conjunction with the cost of living at the different mines. It is often alleged that the higher rates of pay earned by Rand workers (higher, that is, in conjunction with other mining fields) are offset by the relatively high costs of living. We do not see how such a statement can be substantiated by actual fact and figure. As we have often pointed out in the columns of this journal, the controlling mining corporations have lavished money on recreation halls, workers' cottages, etc. Recognising the value of what in America is called "the square deal" to themselves as well as employees, the several companies have elaborated a social system above ground, which in so far as facilities for decent living at very moderate cost go, is, we say without hesitation, not to be excelled if indeed equalled on any other mining field in the world. The numerous model villages along the reef, the general excellence of the food provided by the mine boarding houses, and the almost luxurious nature of the recreation halls, reading rooms, etc., may well be envied by workers on other fields. A word, too, must be said as to the liberal privileges afforded by the mine benefit and sick funds in case of illness. Let us see what it costs employees to participate in this social scheme at the four mines mentioned in the foregoing.

At the Crown Mines rents (inclusive of electric light, water, sanitation, and assessment rates) are per month:—Married men: Class I. (houses generally of better class and/or larger size), rentals from £3 15s. to £5 17s. 6d.; Class II. (medium description), rentals from £2 to £4 15s.; Class III. (old, badly situated, or dilapidated houses), rentals from 10s. to £3 7s. 6d.; Class IV. (Dutchmen's cottages), rentals from 10s. to 15s. Single men: 10s. per room per month; staff quarters, 15s. The boarding house charges are from £5 10s. to £6 10s. per month. There is a junior co-operative mess (for learners) at about £5 per month. Monthly payments to the benefit societies are graded as follows:—Earners of more than 12s. per shift: Married, 12s.; single, 8s. 12s. per shift and under: Married, 10s. 6d.; single, 7s. Recreation club monthly subscription rates are: Earners of more than 12s. per shift, 3s. 6d.; 12s. per shift and under, 2s. 6d.

At the Village Deep rents are:—Single rooms, 10s. 6d.; learners, 5s.; married quarters vary from £3 to £5 10s. per month, according to class of house. Light is included in above rents. The boarding house charges are:—Monthly board, £6; learners, £4; single meals, 1s. 6d. The benefit society charges are:—Married members, 10s.; single members, 8s.; and of the recreation club, 2s. 6d. per month. There is a tennis club, the membership of which is voluntary, the subscription being 2s. 6d. per month; and in addition the Wemmer Pan sailing club has voluntary subscribers at 2s. 6d. per month.

An examination of the Rose Deep housing accommodation shows that rents for married quarters vary from £1 to £4 per month; and for single quarters from 5s. to 10s. per occupant. Electric light costs from 9s. to 14s. 6d. for married quarters and from 1s. 6d. to 3s. for each occupant in single quarters. There are two boarding houses, one for men earning 10s. per shift and over, at £6 per month, and another for men earning under 10s. per shift at £4 10s. per month. Benefit society charges are:—Married men, 10s. 6d.; single men, 7s.; men earning 5s. per shift and under, 3s. 6d. The recreation club subscription fee is 2s. 6d.

At Modder B. single room rents for two in a room is 5s. 6d. and 10s.; and for one in a room 11s. and 20s. Married quarters rents range from £2 to £4 10s. per month, and electric light from 5s. to 10s. per month. The boarding house charge is £6 per month, or 1s. 6d. per meal. Benefit society charges 14s. for married men and 10s. for single men. The subscription to the recreation club is 2s. 6d.

A very little study of these figures should suffice to show that the talk about the high cost of living on Witwatersrand mines is not based on actual fact. The application of the above living rates to the average wages at the mines dealt with above tends to establish the truth of the statement that the average mine employee of the Witwatersrand can save more than he can earn in other mining fields, and moreover he has very little cause for complaint in regard to housing accommodation, fare and recreation, as we shall attempt to show in a succeeding issue.

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NICKEL IN SOUTH AFRICA.

Reported Discovery of Extensive Deposit—Some Account of the Canadian Fields.

Nickel has been discovered in several widely separated localities in Southern Africa, but up to the present no very noteworthy development of the deposits thus far found has been attempted. Whether there is likely to be any real endeavour to exploit South African nickel occurrences at an early date or not, it is difficult to say, but it is perhaps a little significant that considerable attention is now being paid to the nickel producing possibilities of the sub-continent. The best known occurrences of nickel ore in South Africa are those of the Mount Ayliff district in East Griqualand. Fairly lengthy descriptions of these deposits have, from time to time, appeared in the columns of this journal. A discovery of a very large vein containing ores of nickel is now reported from the Bushveld in the neighbourhood of the Pilandsberg. Possibly the next few years may witness something in the nature of a nickel boom in South Africa. So far as we can gather, there is as yet no justification whatsoever for the application of such a term as a South African "Sudbury" to such nickel deposits as have been found, but at the same time it may not be amiss to give a few facts and figures concerning the nickel industry of the world. Although figures of nickel consumption indicate that the metal is comparatively "young" in the industrial world, the metal is beginning to gain a place in the group of "essential" metals. This metal has, however, been employed (largely for coinage purposes) from time immemorial. In these more modern times the principal use to which the metal is put is in the manufacture of nickel-steel. This alloy is advantageously employed for armour-plates, heavy ordnance, and nickel-steel rails. In the past a high price has been maintained for the metal which many manufacturers have found prohibitive in the field of commercial competition. Notwithstanding there is undoubtedly great scope for the exploitation of nickel and its alloys in metal markets. The leading nickel producing area of the world is in the Sudbury district of Ontario, Canada. An interesting account of this field is to be found in Mr. Ralph Stokes' book, "Mines and Minerals of the British Empire." In his account of the Sudbury field, Mr. Stokes says:—"Apart from the pioneering Canadian Copper Company, only one venture—the Mond Nickel Company—stands in the field to-day as a profitable producer. The history of this London company presents a striking contrast to that of the American concern, which first secured the mines, then found the nickel, and subsequently evolved the process to win it from the associated metals. The Mond Company, on the other hand, found its origin in an English laboratory, where Dr. Ludwig Mond discovered the 'carbon monoxide process' for separating copper and nickel. On the strength of this patented process he acquired mines in the Sudbury region and floated them, in conjunction with his English rights, into the Mond Nickel Company, with a capital of £600,000. After frequent checks and difficulties, this concern was placed on a steady producing basis in 1904, and now treats 50,000 tons of ore per annum. In 1902 the International Nickel Company was formed in New York, for the consolidation of the Canadian Copper Company, several works in the States, and extensive New Caledonian nickel interests. The greater object of this amalgamation was to control the nickel-supply of the world—a purpose it has achieved. With assets valued at £6,500,000 at the time of formation, its business has since been enormously extended. In 1906 alone the Canadian Copper Company—the most important constituent enterprise—dispatched to the New Jersey smelters nickel-copper matte containing metal worth one and three-quarter millions sterling. The International Nickel Company is backed by some of the strongest financiers of New York, and ambitious competitors must be prepared for serious difficulties, although there are large deposits of nickel ore still unexploited. . . .

"The metal-production of the Sudbury field has increased steadily since 1896, with the exception of 1904—a year of misfortune. From 1886 to the middle of 1907 there has been an aggregate yield of 74,500 tons of nickel and 55,500 tons of copper, with a valuation of about £16,000,000, based on the price of metal recovered in the Welsh or American refineries. In 1906 340,060 tons of ore were smelted for the production of 20,364 tons of Bessemer matte, containing 10,776 tons of nickel (52·9 per cent.) and 5,260 tons of copper (25·8 per cent.). The value and character of the ore in the several mines vary within limits that are very narrow considering the wide range of deposition. As a rule, the nickel contents exceed those of copper. The extraction value of the roasted ore from the Creighton appears, from matte statistics, to be about 3½ per cent. nickel and 1½ per cent. copper and losses in roasting and smelting are reported at 15 to 20 per cent. The Creighton may be roughly termed a 5 per cent nickel and 2 per cent. copper proposition. Ore dealt with by the Mond Company from the Victoria mines contains equal quantities of the two metals (2·8 per cent. of each). In the early days copper was a more important constituent. Mines of importance in the past were the Frood, Copper Cliff, No. 2, and Stobie; the Blezard, Murray, Elsie and Gertrude have also been extensively exploited. These have been closed down in favour of the cheaper open-pits, or have 'joined the majority' through the failure of controlling companies. The chief producer of to-day—the world's greatest nickel-mine—is the Creighton, which is situated at the lower edge of the norite sheet, 12 miles from Sudbury and 8 from the smelters at Copper Cliff. Work was commenced by the Canadian Copper Company in this deposit eight years ago. The open pit is now about 600 feet long by 300 feet across, and 140 feet deep. With a dip of 40 to 50 degrees to the north-west (below the norite), the mass has been proved by diamond-drilling to extend along the strike for a long distance beyond the wall of the open-cast working. The deposit is largely composed of pyrrhotite, sometimes with visible pentlandite—though this valuable nickel-iron sulphide is generally too finely disseminated to be perceptible by the naked eye. There is also a considerable proportion of chalcopyrite and iron pyrites. The ore from the workings is crushed at shaft-head, classified by trommels and hand-picking into 'coarse,' 'medium,' and 'fines,' and then transported in flat trucks to the roast-yard near Copper Cliff. Here it is bedded into heaps of 1,500 to 3,000 tons, with the fines outside, and the process of 'heap-roasting' commenced by the kindling of wood laid below in suitable air channels. Once the oxidation of the sulphides is well started, the roast continues by reason of the heat evolved by the action, without the addition of further carbonaceous fuel. In three or four months the operation is completed, and the sulphur contents are reduced from 28 to 10 or 12 per cent. A steam-shovel fills dump-cars with this roasted product, which is ready for charging into the furnaces with the necessary additions of fuel, siliceous flux, and green ore. At Copper Cliff three large blast-furnaces—50 by 204 inches at the tuyeres—are employed. The coke-charge varies from 7 to 14 per cent., and the cold air-blast from 30 up to 45 ozs. in pressure. The object is to obtain a matte of 40 per cent. metal, for subsequent enrichment in a Bessemer converter-plant to about 80 per cent. This final matte, ready for shipment, contains approximately 57 per cent. nickel and 22 per cent. copper. The converter slag is returned to the furnaces, and the matte poured into long flat moulds, broken up and dispatched to New Jersey, U.S.A. The process of refining, which involves re-smelting with sodium sulphate, is kept secret in its practical details, and represents in its present highly efficient state one of the company's most valuable assets. The Mond Nickel Company operates the Victoria mines, which lie 23 miles to the west of Sudbury on the Sault branch of the Canadian Pacific Railway. The two main and closely associated ore-bodies are funnel-like in form, dipping at about 70 degrees. According to Dr. Coleman,[*] they belong to the class termed 'offset' deposits, or dike like projections from the basic edge of the norite, as opposed to the marginal deposits. The manager, Mr. Hiram W. Hixon, however, only recognizes the results of aqueous deposition along contracts, and the replacement of those rocks least able to resist the chemical action—viz., the 'greenstones.' The chutes are of large dimensions, yielding 200 to 250 tons of ore per foot a sinking. A vertical depth of 800 feet has been attained. Ore is transported from mine to roast-yard, and thence to smelters by aerial ropeway. Prior to recent extensions the company utilized one of two small furnaces, 44 by 120 inches at the tuyeres. Coke is added to the extent of 11 per cent., and the average blast-pressure is 24 ozs. Here, as at Copper Cliff, an 80 per cent. matte is produced, but the two metals occur in equal proportions. The final matter is shipped to South Wales for the separation of the metals. Canada's only competitor in the production of nickel is New Caledonia. In 1889 this Pacific island yielded ore containing 1,330 tons of nickel; the output increased to 5,210 tons in 1901. In the following year Sudbury gained the lead over the French penal settlement, although the latter held the industrial advantage of cheap labour, of deposits near the coast, and of higher grade ore, in the form of silicate, simple to treat."

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[*] Report of the Ontario Bureau of Mines, Vol. XIV., Part III.

Cobalt and nickel compounds are often found in association, and at another great Canadian camp "Cobalt," also in Ontario, ores of nickel are extensively mined, notably by the Nipissing and Coniagas Companies. Should any really extensive and profitable nickel fields be discovered in South Africa, there should be ample scope for the satisfactory marketing of the product. In the meantime the foregoing facts regarding the great Canadian fields should prove of some value to those interested in the nickel deposits of this country.

FOUR GROUPS OF TRANSVAAL TIN DEPOSITS.

A Summary of the Occurrences Opened Up to Date—"The Most Speculative Form of Speculative Mining."

Speaking of the tinfields in general, Mr. T. G. Trevor, Inspector of Mines, in his last annual report, says, the experience of the past years has been to prove the extraordinary erratic nature of the deposits and their extreme value where large enough to be worked. Even in cases of quite small deposits which have proved utterly erratic and unworkable, the amount of tin ore extracted in the prospecting stage will in many cases go far towards paying the cost of the prospecting. I have studied the question as closely as possible, but so far as I can see, no expert has yet discovered any "constant," concomitten, or indication by which a judgment can be formed as to the permanence of a cassiterite body. Of all speculative mining, tin mining in the Transvaal Bushveld Granite appears to be the most speculative. Up to date the deposits worked seem to fall into four groups, as follows :—

(a) *Fissures in the granite with no fissure filling, but with cassiterite as an incrustation on one or both walls, and, to a certain limited extent, impregnating the granite.*—This group is best represented at Appingendam, Groenvlei, and the old Bushveld Tin Mines. In every case these deposits have proved valueless, the tin, so far as I know, always vanishing within 100 feet of the surface.

(b) *Fissures with true fissure filling.*—These occur in the felsite and sedimentary rocks immediately overlying the granite; the best examples are to be found at Rooiberg, Leeuwfontein, Weynek. Century Tins, Doornhoek, and Welgevonden. With the exception of Weynek, where the tin value entirely ceased at about 150 feet from the surface, these deposits have so far proved satisfactory; the tin-bearing vein or fissure filling may be large or small, rich or poor, but it has continued, and, with the one exception mentioned, not obviously lost value in depth. These deposits, though sometimes payable, are, however, uniformly poor when compared with the other classes.

(c) *Pipe-like Deposits.*—Zaaiplaats, Groenfontein, Solomon's Temple, and, to a limited extent, Rooiberg, make up this group; it is possible also that the Oliphants River Tinfields should be included, but this is not yet proved. These deposits invariably contain extremely rich ore which can be easily and cheaply won, but they are so erratic, both in the continuation of the pipe and in the occurrence of tin in the pipe, that no reliance whatever can be placed on their continuance. Even if a pipe has continued highly payable for several hundreds of feet, it is just as likely to become valueless within the next ten feet as a pipe just found, and there is no indication of any sort yet known to guide one in estimating its probabilities. In the same way a barren pipe may again become tin bearing at any moment, but why this is so we are still in absolute ignorance. At Rooiberg certain pipe-like bodies pass through the country rock from one vertical reef to another; these also enlarge along the bedding plane of the rocks into the rich "flats" which form the richness of the Rooiberg Mine near the surface.

(d) *Irregular occurrence in the felsites and sedimentary rocks overlying granite.*—These are best represented at Grootrivier, Welgelegen and Witfontein. The cassiterite is extremely fine, and seems to have impregnated the rocks along any cracks or crannies which happen to be there, regardless of any consistent fissure or vein. The ore, such as there is of it, is often very rich, but in no case has a deposit of this sort proved satisfactory, for the tin has always been lost within a few feet or tens of feet of the surface, and I do not think that the total quantity of ore extracted from any one such deposit has ever amounted to more than 100 tons or so.

With regard to the occurrence of cassiterite and where it is likely to be found, so far it has never been discovered at what may be termed "a depth' in the granite. If the Bushveld Granite was originally a laccolite, then a section through the mass would—to borrow a metaphor from the kitchen—be similar to that through a pie-dish and pie; the pie-dish would correspond to the norite lining beneath which the granite was injected. Denudation has removed much of the pie crust and in places eaten deep in the pie, but wherever tin is found, it is either in the remaining pie-crust or in the pie in the immediate neighbourhood of the crust, and never, so far as I yet know, in the deeper granite exposed by the denudation or in the norite. As there are still many places where masses of sedimentary rock occur overlying the granite which have not yet been prospected for tin, notably in Secoecoenie's country in the east and Ramatok's in the west, it is probable that we may see the tinfields largely extended in these directions.

PROGRESS AT MACHAVIE MINE.

Trial Run Successful—Improved Extraction—Some Novel Features of Plant.

The mill on the Machavie property has successfully completed a trial run of some weeks. A good deal, however, remains to be done before the whole reduction plant is in working order. About 2,000 tons have been crushed so far, but the mill has only worked an average of about 16 hours per day up to a few days ago. The prospects of the company are good, enough having been done thoroughly to test the plant and the ore values. The mine is well opened up, and the values go upwards of 9 dwts. over from 3 ft. to 4 ft., and an extraction of 8 dwts. can be and is being made. The plant is of the most modern type. In addition to the ten stamps originally erected, four Nissen stamps have been installed. From the amalgamating tables the pulp flows on to Wilfley concentrating tables, the concentrates being treated at the Delmore works. After passing through cone separators, the pulp flows into a 24 ft. tube mill, and thence over other amalgamating tables. The overflow from the cones, the value of which is 2·2 dwts. per ton, is cyanided. The whole plant is run by electricity, which is generated by means of two suction gas engines of 200 horse-power each. At the main shaft, which is vertical and 116 ft. deep, the ore is shot into an ore-bin, and thence fed on to a sorting belt, where about ten per cent. is thrown out and the balance goes through a Gates crusher into another ore-bin, under which trucks run and are hauled up to the top of the mill. It is expected that by the end of the month everything will be shipshape and in first-rate working order. Mr. Lars Pedersen, the manager, and Mr. C. O. Schmidt, are exerting themselves to the utmost to pilot the property to a successful issue.

MINERS' UNREST ON OTHER FIELDS.

Men's Demands Elsewhere and their Effect on Industry.

It is a well-known industrial phenomenon that workmen should agitate most for higher wages or equivalent concessions during periods of trade prosperity. At the present time, the coal trade in England, which follows other industries, if not at its height is at least not yet definitely on the down grade and in every direction we find the same state of affairs; demands for more money and less work; demands for the "levelling up" of workmen who claim not to have shared in recent advantages; demands for allowances and concessions of all descriptions; and on top of these, an organised general agitation to compel the entrance into membership of the Miners' Federation of all non-Unionists. The non-Union question, to take the last point first, has been developing in acuteness, first in one district in England then in another, for many months past and indicates a determination on the part of the Federation to recoup its strike losses by bringing all possible pressure to bear on those who are without its ranks. During the past few weeks there has been trouble in the north of England, and the Federation Committee of the men's Unions has issued a circular stating that drastic action to put an end to the employment of non-Unionists is being seriously considered. In Lancashire the strike weapon has already been put into operation, and at one colliery it has had the effect of bringing in the majority of the non-Unionists. The same process, has, however, it appears, to be gone through at other collieries, of which there are several in the Wigan and Bolton areas, employing between 5,000 and 6,000 men, where strikes are pending. Similar trouble is being experienced in Nottinghamshire, North Staffordshire and elsewhere. Turning to other than non-Union problems, we find every mining district with trouble of one kind or another. In the Yorkshire coalfield there is considerable danger that 120,000 men will hand in their notices. The difficulty there is with the surface men, who, since the passing of the Minimum Wage Act, have been trying to secure a minimum wage for themselves. In South Yorkshire they have succeeded. In West Yorkshire the owners have consented to negotiate, but insist upon dealing with individual Unions separately. In the Leicestershire coalfield difficulties have arisen with respect to the amount of the minimum wages to be paid to miners working on contract who fail to earn the wage. So far, no agreement has been arrived at. In South Staffordshire the colliery engine winders and stokers are demanding an eight hours' day, with a standard rate of pay of 6s. 3d. per day. It is reported that unless these demands are met notices will be handed in. This would have the effect of bringing the coal industry of South Staffordshire and East Worcestershire to a standstill. In Northumberland the men want better house coal; county percentage to all minimum wages; free tools and explosives to all workmen; chargemen to be paid at the same rate as deputies; and the immediate remedying of alleged grievances of night workers. In the Sheffield and Woodhouse districts the pit boys have taken the law into their own hands, and been on strike—for what act of grave injustice? Merely as a means of "persuading" the management to run an annual picnic for them. In Cumberland there has been a 22 weeks' strike of colliery surfacemen, not on account of disputes with the management, but owing to disagreement between the Miners' Association and the Amalgamated Union of Labour. In several centres the latest thing in demands is that the mine-owners should grant a week's holiday annually to each man and lad employed in and about the mines, subject to a certain amount of time being worked. The proviso makes the suggestion interesting and possibly worth considering. Naturally the intention is that they shall be paid while away on holiday, and the question therefore arises as to whether such a gift on the part of colliery owners would in practice affect the number of absentees from work. Other districts have the same or other agitations, and so the ball goes rolling on.

POSITION AND PROSPECTS OF THE NAMAQUALAND COPPER MINES

Authoritative Account of Little Known Fields.

A visit to the copper mines of Namaqualand during the year brought to the notice of the Department certain matters of considerable interest, says the Government Mining Engineer's annual report. The mineral belts, which take the form of irregular stock works, show evidence of having their richest mineral deposition near the surface, though not always at the outcrop. Although these trend roughly in an east and west direction, there is very little as a rule to assist the prospector in tracing the lines of weakness in which the depositions appear to have taken place. While this forms one of the difficulties of prospecting, it is also in a sense a hopeful feature, because the lack of promising outcrops, which is a characteristic of the position to-day, need not imply that there are not other deposits of a similar character to those which have been worked for so many years still waiting to be developed. A large number of leases were granted at one time by the Cape Government in the neighbourhood of the workings of the two principal companies, the Cape Copper Company and the Namaqua Copper Company. Practically none of these leases have ever been worked, on very few of them have rents been paid, and many of them should have lapsed already from effluxion of time. These leases have, however, continued to remain on the books, and one of the first necessities for the encouragement of prospecting in the district is that they should be cancelled, and steps are being taken accordingly. Considerable sums have during the past years been expended by both the working companies, but more especially by the old Cape Copper Company in the neighbourhood of the great O'okiep Mine, in boring and general prospecting work both on the surface and underground, but the indications seem to imply that the richest portion of the mineral deposit which has made this mine has been worked out, and its extension in depth below the present bottom of the mine (800 feet) seems to be unlikely. With the new water jacket furnaces now being erected by both companies, there will be several years' life before the mines in working the lower grade ores still on hand, but if the future of Namaqualand as a mining country is to be established, further discoveries will have to be made. There seems to be no prima facie reason why the masses of gneiss forming the mountain range of Namaqualand should not contain very similar deposits to those which have been exploited in the past. An interesting feature of the Namaqualand industry is the long period during which miners, both white and coloured, have worked and lived on their present mines. A considerable number of the coloured boys employed have been brought up as youngsters and have reached middle age in the O'okiep and Concordia Mines; while white men from Cornwall and elsewhere, when asked how long they have been in the mine, especially consult the mine captain to jog their memories and try to recall the date when they first came to Namaqualand over thirty years ago. The coloured boys employed are mostly half-bred Hottentots, locally known as Bastards, who make an excellent class of miner, steady and intelligent. With these workers who have been trained and brought up in their own mines, it has been possible for the companies to carry on dangerous mining work involved in gradually extracting pillars from the old workings with scarcely a single serious accident being recorded. It is a striking testimony to the benefits derived by any district from successful mining development to see the extent to which farmers, transport riders, storekeepers, and others in the district owe their prosperity to the copper mines, and to the trade which is fostered by their existence in their midst.

Rezende Mines.

The results for the month of July, 1913, are as follows: Central section, estimated profit, £1,567; old west workings, estimated profit, £692; Penhalonga section, estimated profit, £383; total estimated profit, £2,642.

THE MINES AND THE FIGHT AGAINST PHTHISIS.

Important Statement by Chamber of Mines.

THE following communique has been issued on behalf of the President of the Transvaal Chamber of Mines:—

In view of the misleading cables that are being sent to England, at the instance of the Transvaal Federation of Trades Unions, with a view to prejudicing the Government of the Union and the mining industry in the minds of the people in Europe, and of enlisting sympathy on the side of the Labour leaders and the promoters of recent disturbances, the President of the Transvaal Chamber of Mines makes the following statement regarding the origin and development of the recent strike, and the events that concern the mining industry in connection with it.

RECENT STRIKE.

It will be remembered that the New Kleinfontein men went on strike because five underground mechanics were asked to work from 7.30 a.m. to 3.30 p.m. every day instead of from 7 a.m. to 3.30 p.m. on five days per week and from 7 a.m. to 2.30 p.m. on Saturdays. It will be further remembered that the company withdrew this condition, reverted to the old hours of working, and invited all its employes to return to work, leaving their places open for five days, before engaging any new men Meanwhile the strike leaders made fresh demands, which the company refused to entertain. Then followed the Benoni meeting and the era of "pulling out" men from the mines. Three facts in this connection should be borne in mind: (1) That the mines on which ballots were taken invariably declared against striking; (2) that Mr. Bain, on behalf of the Strike Committee, wrote to several of the companies, whose men had been "pulled out," stating that the men were only striking in sympathy with the New Kleinfontein men; (3) that during all this time the matters of health conditions and miners' phthisis were never mentioned as a grievance. It is essential to bear these facts in mind, because the Federation leaders are now exploiting this disease to enlist sympathy, to cover up their declared causes of quarrel, and to divert attention from the various demands they have since put forward.

MINERS' PHTHISIS SANATORIUM AT MODDERFONTEIN.

MINERS' PHTHISIS.

In view of the fact that the disease known as miners' phthisis has now been raised as a battle-cry, it may be as well to give some particulars of the steps which have been taken to cope with it, and the results thus far secured.

It is only in recent years that the seriousness of the position with reference to miners' phthisis has been realised, either in South Africa or in other parts of the world. In 1907, the Mining Regulations Commission was appointed by the Transvaal Government and issued an interim report in 1908 particularly dealing with regulations for the prevention of dust. The final report was issued in 1910, in which the Commission expressed the following opinion:—

"We understand that there has been a ready compliance on the part of mine managers with the regulations for the prevention of dust, gazetted December 21, 1908, but that there is a considerable difficulty in keeping the rock-drillers up to the mark, owing to their incredible indifference, not to say recklessness, and also in some degree to the absence of definition as to the official directly responsible for reporting such neglect."

Up to the passing of the existing Mines and Works Act, 1911, the miners themselves had not been personally liable for breaches of regulations made for the prevention of dust, and the greatest difficulty had been consequently experienced in ensuring that regulations of this nature were carried out by them.

SANATORIUM.

In 1908 negotiations took place between the Chamber of Mines and the Government with a view to the establishment of a sanatorium for miners' phthisis patients, resulting in the Government granting a building site and undertaking to pay half the annual contribution towards the maintenance of the sanatorium. This sanatorium has been erected at a cost of £52,000 to the gold mining companies. The annual cost of maintenance is approximately £11,000 a year. The sanatorium was opened in November, 1911, and provides free accommodation for seventy patients.

At the beginning of 1912 the Government established a permanent committee, consisting of the consulting engineers of the various companies, mine managers, miners and officials of the Government Mines Department, with the Government Mining Engineer as chairman, for the purpose of making experimental investigations into the best means for the prevention of miners' phthisis. This committee has reported from time to time, and various amendments to the Mining Regulations have been made in consequence. The funds necessary for the carrying out of its objects are provided by the Government and the mining industry in equal shares.

COMPENSATION.

In 1912, the Miners' Phthisis Act was passed. The amount of compensation awarded since the Act came into force up to the 30th of April, 1913, is £655,832. This expenditure, with the exception of some £20,000, part of a sum of £100,000 voted by Parliament to assist the poorer mines in carrying out their obligations under the Act, falls solely on the mining companies.

In addition to this sum, the contributions by the companies to the Insurance Fund established under the Act for the purpose of compensating claims arising after the 31st of July, 1914, now amount to £73,000.

GOVERNMENT ENGINEER'S OPINION.

In 1913, a Select Committee of the House of Assembly was appointed to inquire into the question of the extension of the field of employment for Europeans throughout South Africa. The Government Mining Engineer gave evidence before that Committee in April last, and when asked if he thought it was a healthy principle to encourage people to work on the mines, he gave the following answer:

"Yes. Two years ago I should have had my doubts, because of the miners' phthisis business, which was brought home so forcibly to us. I should have said that the life of a miner, which is from five to ten years, was not one that should be attractive to anybody. But to-day, the conditions are so much improved and the changes made are so great, that I think it would be difficult for a man to get phthisis. We can certainly retract what we then thought, and look upon mining not as a disaster to the individual taking it up, but as a means of prosperity to him and to the nation."

CONDITIONS TO-DAY.

The above expression of opinion of the Government Mining Engineer shows the existing conditions on the mines as regards health at the present day, and affords the best refutation of the exaggerated and misleading statements that have been published in the Press during the last few months.

The mines have also spent large sums in installing extensive systems of underground ventilation, and also in laying on water throughout the underground workings.

These facts show that, so far from there having been any neglect on the part of the mining companies, every precaution recommended by competent authority has been taken at very heavy cost, and it may be safely asserted that to-day the risk to anyone taking up underground work is far less than it was a few years ago.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Position of "The Jumpers."

To the Editor, *South African Mining Journal.*

Sir,—With reference to the announcement by this company at the beginning of July to the effect that the shafts of both "The Jumpers" and Treasury sections had been finally closed down—in view of the fact that the clean-up of the company's works has not been completed as yet, it has been decided that no declaration should be made in respect of the results of operations in July, but that the company should make a declaration so soon as possible after the completion of the clean-up. We are further instructed to inform you that the joint-working agreement with the Treasury Gold Mines, Ltd., having been terminated by mutual consent, the treatment of such further surface accumulations at "The Jumpers" Mine as may be found to be payable will continue for the sole benefit of this company.—Yours, etc.,

"The Jumpers" Gold Mining Co., Ltd.,
Credit Mobilier Francais,
Secretaries.
C. H. HOLDER.

90, Exploration Buildings,
Johannesburg August 9, 1913.

Insurance Funds and the Local Loan Issue.

To the Editor, *South African Mining Journal.*

Sir,—It was with great interest that I read your article on this matter in your last issue of the 9th inst.; but to my mind, the most important part of the article is your reference to the Insurance Law in the Dominion of Canada. South Africa is far behind the times and has practically no insurance laws. The deposits that the Government makes it compulsory for insurance companies in this country to have are totally inadequate, and no protection to policyholders in this country. This is a question apart from the one you raise. The point made by you is that if the same law were in force here that is in Canada, the local loan issue of £6,000,000 might have been successful. This is undoubtedly the case, and it is only when the Government is faced with a failure of this description that they realize their shortcomings and what might have been if they had been more farseeing, particularly in the case of legislation as mentioned by you; and I would recommend the Government to obtain a copy of the Blue Book containing the Canadian insurance legislation and the speeches made by Canadian statesmen on the subject, at the time the Act was passed. The more money there is available in the country the more chance there is of a local loan of this description being a success. But the question raised by you opens up a much more important one altogether, and that is the protection of local policy holders in foreign companies as well as local companies. I shall not deal with the question of local companies because the Government ought to be sufficiently cognizant of their dealings to be in a position to protect their policy holders, but the question of the protection of local policy holders in foreign companies is one that the Government ought to at once take steps to deal with. It is only recently that a scare has been raised, and I think that the local policy holders of foreign companies should themselves approach the Government and demand protection. The only way to protect local policy holders in foreign companies is for the Government to pass legislation as is in force in Canada. Suppose, for the sake of example, that a foreign insurance company went insolvent, what would be the position at present of their policy holders in this country? The deposits with Government would be a mere bagatelle, and it is a question whether the Government could retain them for the policy holders. The result would be that local policy holders would be badly hit, and in the event of the company being taken over would have to abide by the taking over company's terms. If, on the other hand, the Government passed legislation similar to that in force in Canada, and made the foreign companies have their reserves in the country, and those reserves were the particular property of the local policy holders, the latter's security would be totally different. The companies in their returns would have to give a list of their local investments, which would be scrutinized by the Government and certified as sound. At present the local policy holders of foreign companies are absolutely unprotected by the Government, which is in a way an even more important question to deal with than the one you raise. The Canadian Government passed legislation primarily to protect their own people, and as the Government of South Africa is so anxious to look after *their* own people's interests, this should be their primary object as well.—Yours, etc.,

PROTECTION.

The Local Loan Issue.

To the Editor, *South African Mining Journal.*

Sir,—I was pleased to see that you had the temerity to publish my letter in your last issue in which I suggested that a Government lottery be started in order to raise funds for the loan of £6,000,000. You also did me the honour to write a leading article on the subject and drew attention to my letter. I quite agree with your remarks that the proportion of deposits to advances in our banks shows a very dangerous margin and that if money is to be taken from the banks and deposited with the Government at 4 per cent. it means that fixed and floating deposits will decrease and the banks will be unable to accommodate business men. Our credit is not too good across the water, and I am afraid the country will be faced, on the top of the strike, with a financial crisis that will take years to remove. The Cabinet would be wise to consider very seriously the suggestion made by you, *i.e.*, that all insurance companies doing business in this country should invest a sufficient amount of money in South African Government securities in proportion to the amount of insurance affected by the inhabitants of this country in both life and fire. There would be no hardship or restriction placed upon the insurance companies so long as they receive a return of interest on their money retained by the Government equal to the interest they are able to earn by their investments in their own countries. The annual premiums that have been taken out of South Africa during the last twenty years must run into millions of money, and it is only fair, after having allowed these foreign insurance companies a free run to exploit our country to ask them to deposit in Government securities an amount equal, say, to their annual policies. I do not suggest making this retrospective, and neither would I suggest that the poorer companies doing but little business should invest a similar amount to the larger and more prosperous companies. This could easily be worked out by one of our leading auditors, and to arrive at the proportion of business done the companies would be required to file half-yearly statements with the Government Treasurer. I am afraid, so long as the present party is in power, there will be no hope of ever getting the Cabinet to recommend a tax upon land. That would be expecting too much, and so contrary to the ideas and beliefs of the backveld farmer that any Minister attempting to bring forward a motion of such a nature would be howled out of the House of Assembly. We shall have to wait until such time as a truly democratic party is strong enough to take the reigns of Government before any tax on undeveloped land is passed in South Africa, or possibly the Young Unionists may capture sufficient seats at the next election to force legislation in this direction. If the newspapers of this country, both Dutch and English, could be induced to educate the people up to seeing and believing that there is nothing immoral in raising Government and Municipal loans by means of State lotteries similar to the methods practised in Germany, France and other Continental countries, there would be no danger of the banks placing restrictions upon commercial men and farmers requiring accommodation. We want such papers as the *Volkstem* to take the matter up and gradually educate the country folk by pointing out that under the lottery system more money comes into circulation and the greater the supply the better facilities we will all be able to get from banks and other financial institutions.—Yours, etc.,

FINANCE.

Length of Tube Mills.

To the Editor, *South African Mining Journal*.

Sir,—The casual observer of tube mills in reading Mr. Farrar's letter which appeared in your issue of the 3rd inst. and your comments thereon would take it for granted that ample proof had been advanced to show that the tube mill 16 feet long is more efficient than tube mills of greater length. This is not the case. Mr. Farrar states that a 24 feet tube mill was run side by side with a 16 feet tube mill and that better efficiency to the extent of about 35 per cent. was obtained from the shorter tube mill, hence the adoption of shorter tube mills on recently constructed milling plants. Mr. Farrar does not give the diameter of these tube mills, but for the sake of argument let us assume that they are both 6 ft. diameter. In the case of the Langlaagte Consolidated each 16 ft. tube mill crushes approximately 215 tons of stamp mill sands, so that for the extra power consumed by a 24 ft. mill it would have to crush, say, 270 tons in order to give the same efficiency as the 16 ft. mill. The long tube mill cannot do it for the simple reason that 270 tons for the first 16 feet or thereabouts of its length is an overload and this long tube mill ought to for some distance of its length be of greater diameter than 6 ft. Then again we have arrived at the conical mill. Obviously, however, for each length of tube mill there is a corresponding diameter which will give maximum efficiency, and it is quite possible that the new standard tube mill, 16 ft. 5 in. long by 6 ft. diameter, is correct. With long tube mills of 22 ft. 6 in., 24 ft., or 30 ft., there is a possible interference in crushing efficiency owing to the large amount of fine sand towards the outlet end, but until the proper diameter for these mills has been arrived at no argument has been advanced to show that the short tube mill is any more efficient than the long one. Long tube mills were never in the fashion, either in America, Mexico, Australia, or New Zealand. In the majority of cases the tube mills employed elsewhere are 20 ft. long and under. In West Australia it was reported some years ago that the 18 ft. and 20 ft. tube mills were cut down to 13 ft. and 15 ft. respectively, in order to improve their efficiency. In view of that statement it is reasonable to ask Mr. Farrar if he has cut down the 24 ft. tube mill in order to equal the efficiency of its 16 ft. neighbour.—Yours, etc.,

G. A. ROBERTSON.

Germiston,
14th August, 1913.

Gold Mining and Agriculture.

To the Editor, *South African Mining Journal*.

Sir,—I beg to submit to the Government and to the people through the medium of your pages, a scheme which I ambitiously consider would in a short period so alter living conditions that everybody would taste the pleasures of life. It remains, I think, for those in power to seriously consider the matter and at any rate to prove the possibility or the reverse of the whole subject. Before going further I would like to mention that the figures quoted are, in my opinion, underestimated, but in any case that would not affect the actual result and object of this letter, viz., utilization of the mineral industry for the foundation of a perfect agricultural colony second to none in the world. The Government of South Africa own a tremendous extent of land, a very great part of which is rich in gold and other minerals—for argument sako we will say that there is land sufficient to absorb ten millions working capital for the extraction of the gold, etc., divided into, roughly, 50 mines, each having a capital of £200,000. With proper running and a payable reef, a net profit per mine per month of £20,000 should easily be obtained. Thus the 50 mines would give a total monthly net profit of one million pounds. I have now come to the important section of my scheme—that is, how to obtain the initial capital of ten millions. This is done by the public being invited to take up £5 bonds, which will participate in a monthly draw for the profits of one million pounds, these profits being divided up as follows:—100 bondholders each receive £2,000 = £200,000; 8,000 bondholders each receive £100 = £800,000; total, £1,000,000. The bondholders who are entitled to the £2,000 should be paid £1,000 cash and the balance of £1,000 should be devoted to the purchase of land and farming implements, etc., and a proviso must be made that the land is to be worked either by the bondholder or someone he puts into it—if he decides to put someone else into it instead of farming it himself, well the object has been attained of putting each month one hundred men on the land. If he feels he is not suited to the life he should easily obtain a manager at £30 or perhaps less per month. The life of each mine could be stated as 21 years, and in exactly this period 2,000,000 bondholders are paid out, 25,200 men are placed on the land, and the balance receive 100 per cent. on their invested interest. There would be no necessity for a man to insure his life. Instead he buys 20 £5 bonds and must inside 21 years get a minimum of £100 for each bond, netting the sum of £2,000, and, of course, he runs the chance of drawing one or more of the £2,000 prizes.—Yours, etc.,

" SEMPER PARATUS."

ANSWERS TO CORRESPONDENTS.

"Subscriber."—Washing has been started. It is not yet possible to say what the results will be. Prospects seem good.

" Anxious."—Enquiries are being made.

" Tin."—Work has been suspended, pending the raising of more capital.

Witwatersrand Deep.

Revenue £199,972 9s. 6d., or £1 9s. 2·14d. per ton; cost £118,004 12s. 11d., or 17s. 2·62d. per ton; profit £81,967 16s. 7d., or 11s. 11·52d. per ton; yield, mill 35,818·530 fine ozs., cyanide 11,736·238 ozs.; capital expenditure, £17,625 14s. 2d.; development work, 3,832 feet. Reef values: Of the total development, £2,789 feet, or 72·78 per cent., has been on reef. Altogether 2,483 feet have been sampled. This total comprises 2,363 feet, or 95·17 per cent., averaging 11·41 dwts. over 41·79 inches; and 120 feet, or 4·83 per cent., averaging 4·77 dwts. over 18·10 inches. The same remarks are made about the strike as in the report of the Consolidated Main Reef.

SWAZILAND TIN, LIMITED

(Incorporated in the Transvaal).

NOTICE TO SHAREHOLDERS.

NOTICE is hereby given that the Eighth Annual Ordinary General Meeting of Shareholders will be held in the Board Room, The Corner House, Johannesburg, on FRIDAY, 12th SEPTEMBER, 1913, at 12 noon, for the following business:—

1. To receive and consider the Balance Sheet, Working Expenditure and Revenue Account, and Appropriation Account, for the year ending 30th June, 1913, and the Report of the Directors and Auditors.
2. To elect Directors in the place of Messrs. H. C. Boyd and Francis Oats, who retire by rotation in accordance with the Company's Articles of Association, but are eligible and offer themselves for re-election.
3. To elect Auditors in the place of Messrs. Alex. Aiken & Carter, who are eligible for re-election, and to fix their remuneration for the past audit.
4. To transact General Business.

The Transfer Books of the Company will be closed from the 12th September, 1913, to the 19th September, 1913, both days inclusive.

By Order of the Board,
TRANSVAAL CONSOLIDATED LAND & EXPLORATION CO., LIMITED, Secretaries,
W. E. S. LEWIS, Secretary

Head Office: The Corner House,
Johannesburg, 12th August, 1913.
3543.

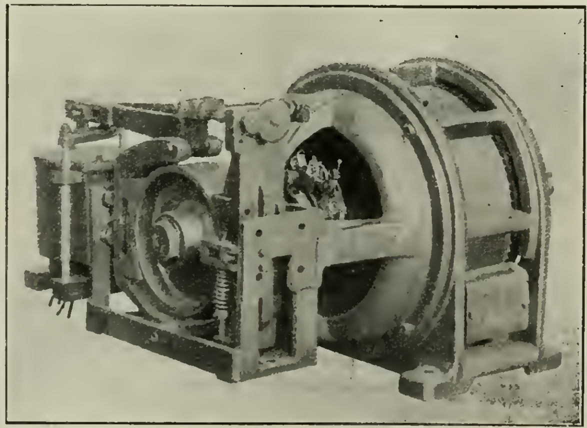
PROGRESS OF MINERS' PHTHISIS PREVENTION—II.

Points from the Interim Report—Character and Measurement of Dust.

The amount of dust present generally in the air of a Witwatersrand mine may, eventually be reduced so as to compare favourably with that in the air of a city, or in factories, or in other kinds of mines. Of course, at particular points in a mine, and at certain times, the amount of dust may be excessive, but except immediately after blasting these local accumulations of dust in air can be prevented by the free use of water. The amount of dust is not necessarily a comparative measure of the danger to health which may exist, as the character of the dust is also important. Numerous experiments were made to test whether a solution of molasses in water was superior to water for laying dust in mines. The result showed that water was, on the whole, superior for laying dust in mine workings by spraying, though probably once the dust is caught and coats the sides of the workings, the molassine solution. since it does not dry out, holds the dust more persistently. (*f*) *Respirators.*—Numerous experiments were made with different types of respirators in order to test their efficiency. Where the amount of dust in the air was small, the efficiency was fairly good in one or two cases. The best result was obtained in one case where the dust amounted to 6 milligrams. The respirator passed only 0.7 milligrams—that is, 88 per cent. of the dust was caught. Where the amount of dust in the air was high—say about 50 milligrams—all the respirators failed to catch the dust, and some passed 100 per cent. of it. On the whole, the experiments demonstrated that respirators were not efficient as dust-catchers. (*g*) *Character of the Dust in Mine Air.*—The dust in the air of mines is exceedingly small in size, and sharply angular in character. A microscopic examination of the dust in air after blasting, where no water-blast was used, showed that 10 per cent. was over .007 millimetre in diameter, and that the remainder was mostly of a diameter of .003 millimetre, and less. Where sprays were used the average size of the dust was smaller. Several hundred millions of such particles were caught in each of the samples taken after blastin.g Both chemical analysis and microscopical examination seem to indicate that the dust in the air of mines on the Witwatersrand has less silica than the original ore, and that the dust in air which has been subjected to sprays of water has again less silica than that which has not been so treated. The following analyses are of interest in this connection :—

Constituents.	Original Ore.	Constituents.	Dust (ignited) from blasting.	Dust (ignited) passing sprays, after blasting.
SiO_2.	87.5%	SiO_2.	69.8%	66.0%
Al_2O_3.	8.9%	Al_2O_3.	22.5%	23.0%
Fe.	1.75%	Fe_2O_3.	1.5%	4.0%
CaO., MgO., TiO_2.	Traces.	CaO.	1.0%	4.0%
S.	1.1%	MgO.	2.0%	3.0%
		TiO_2	0.2%	—

Repeated microscopic examinations of the lungs of silicotic victims have been made, and comparisons have been instituted between the physical characters of the extraneous mineral matter in these lungs and those of dust arising from various mining operations. At the present time, it may be provisionally stated that the dust originated by blasting most closely resembles the dust incarcerated in the silicotic lung, and that in the order of similarity this is closely followed by that arising from drilling operations—both hand and machine. Dump dust, and dust from compounds and streets, are not characteristically present in silicotic lungs. (*h*) *Risk of Direct Infection by Tuberculosis in Underground Workings and on the Surface.*—For this purpose, samples of expectorated material have been collected from the ladder-ways, stations, and ways underground, and from the compounds, single quarters, and beer-halls on the surface. Of 322 specimens examined, 120 have been obtained on the surface, and 202 underground. Of the surface specimens, about 2.5 per cent. have been found to contain bacillus; and of the underground specimens, about 15 per cent. have been found similarly infected. As far as they have gone, these investigations appear to justify the assertion that the underground workings are infected, to a certain extent, with the bacillus of consumption, and that the ladder-ways, owing to expectoration which is induced by the great exertion of climbing, are especially infected. *General.*—A synopsis is appended showing the improvements in dust allaying, effected since 1903. The Committee, at a later date, will present a more detailed account of its various experiments and investigations.



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GOLD FIELDS RHODESIAN DEVELOPMENT CO.

The Balance Sheet Analysed—Ore Reserves of Subsidiaries.

THE report of the Gold Fields Rhodesian Development Company for the fourteen months ended March 31st has just been issued. The document contains interesting references to the affairs of subsidiary companies, but as it contains no suggestion of a dividend payment, and as, moreover, there has been very heavy depreciation in shares during the period covered by the report, shareholders are scarcely likely to regard it as an entirely satisfactory statement. This company is a subsidiary of that great undertaking, the Consolidated Gold Fields of South Africa. It is an amalgamation of interests including the Rhodesia Exploration and Development Co., and has large holdings of the Shamva Mines, the Eldorado, Falcon, Lonely Reef, etc. Investments at book cost figure as an asset for £2,856,337. In order to reduce this so as to represent the true market value of the investments at March 31st £508,296 is written off as depreciation, and in addition £70,000 is transferred from share premium account for the purpose, and thus the asset comes down from £2,856,337 to £2,278,011. Another asset, "Mining properties, farms, and ventures," figures at £311,437, and to bring it down to its true value £135,000 is provided out of the share premium account, and so that item is reduced to £176,437, while investments have been written down by £508,296, which represents part of the depreciation. The work which has been achieved by the subsidiary companies has been excellent. Efforts have been concentrated in development of the various mines controlled, and the results in the main have been thoroughly satisfactory. The Shamva has 2,300,000 tons of ore in sight, of a value of 5 dwts., and the plant will be crushing early next year. The Antelope and Bell mines will be producing this year, the Falcon late in 1914, and the Golden Kopje early next year. A profit of £67,000 was secured during the fourteen months under review. The following table shows the ore reserves blocked out at the various mines:—

Company.	Ore Reserves. Tons.	Value. Dwts.
Antelope	162,082	9·7
Asp Gold	100,669	7·9
Planet-Arcturus	246,047	12·8
Shamva	2,319,752	5·0
Falcon	817,011	5·7*
Bell Reef	45,735	11·68
Golden Kopje	310,746	8·0

* Also 2·62 % copper.

This makes a grand total of 1,023,692 tons, of a value of £6,362,759.

Pniel Diamonds.

A special general meeting of the Pniel Diamond Mining Company, Ltd., was held this week to confirm the voluntary winding up and sanction the agreement regarding the sale to a new company called Pniels, Limited. Mr. H. de V. Steytler was appointed liquidator, and stated the proceeds of the sale would enable the old company to pay out its creditors in full, while shareholders would also receive sixty thousand shares in the new company. The necessary resolutions were adopted unanimously.

Glynn's Lydenburg.

Mr. H. C. Boyd presided at a meeting of Glynn's Lydenburg, Ltd., at the Corner House last week. The amended articles of association were agreed to. In reply to a question by Mr. Wertheim, who said he had been asked by some shareholders in Europe to get some idea why the shares of the company have gone down and when the mine was likely to be worked out, Mr. Boyd pointed out that the profits of the company had fluctuated. To a large extent that had been due to the fact that the power had been interrupted. Last month, however, the profit was quite satisfactory. The mine had also been short of labour, and, of course, it was not quite what it was. It was more expensive to work—the ground was harder, and so on. The matter had been exercising the minds of the Board very much, and it had asked for an independent report on the prospects of the company, and it hoped that report would be undertaken this week, and, as soon as it was received, it would be published. It was really difficult to say just at the moment how things were.

City and Suburban.

The following are the details of the City and Suburban Company's operations for July:—Tons milled, 22,000; gold recovered from current operations, 10,534 fine ozs.; profit, £18,000. In addition to the above, a special clean-up was made in the reduction works, which resulted in a recovery of 5,023 fine ounces of gold, valued at £20,961, making a total profit of £38,961.

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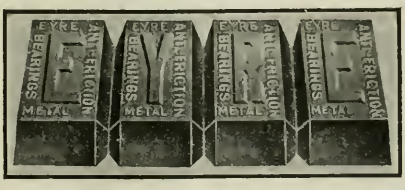

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JULY OUTPUT IN DETAIL.

All-Round Decrease in Returns—Profits Reflect Strike Expenditure.

THE following are the salient figures of the July output:—

Total output	655,389 ozs.
Value	£2,783,917
Decrease	91,688 ozs.
Value	£389,465
Rand output	625,107 ozs.
Value	£2,655,286
Decrease	91,160 ozs.
Value	£387,223
Outside districts	30,282 ozs.
Value	£128,631
Decrease	528 ozs.
Value	£2,242
Total stamps	10,015
Increase	93
Rand	9,485
Increase	115
Outside	530
Decrease	22

The gold production for the month is down by nearly £400,000 compared with June, and the profits, naturally, in the circumstances have suffered in an even greater degree. While June was a thirty-day month, the interruptions to work in July make all accurate comparisons out of the question. The Witwatersrand output of 625,107 ozs., value £2,655,286, shows a decrease of 91,160 ozs., value £387,223, compared with June, which is explained sufficiently by the remarks above. Outside districts with a return of 30,282 ozs., value £128,631, show a decrease of 528 ozs., value £2,242, which is probably accounted for by what may be termed the sympathetic unrest caused by the disturbances on the Rand. Turning to the averages of the daily output it will be seen that the daily output for the Rand is behind the average reached for May by £18,669, and May, in its turn, was £2,700 below April. June being a thirty-day month, comparison with it is omitted. The average daily profit of the group returns cannot be made because the figures are not complete. The native labour returns according to the Native Labour Association's figures, show that the efflux of natives during July was, as anticipated, excessively severe, in fact the heaviest on record. The ebb set in very early this year and the wastage for May and June, totalling over 18,000, extremely heavy as it was, is now doubled for July alone. It brings the labour complement for the gold mines below what it has been for three years.

THE LABOUR POSITION.

There is a decrease for July of 18,785, according to the W.N.L.A. figures, compared with June, which was in itself 10,243 short of May and 8,026 short of the April return in the total employed on gold, coal and diamond mines. There is a decrease on gold mines of 17,852, on coal mines an increase of 343, while diamond mines decreased their complement by 1,276. The figures for the past three months of the numbers employed by members of the W.N.L.A. at the last day of each month read:—

	May.	June.	July.
Gold mines	197,644	188,094	170,242
Coal mines	9,062	9,060	9,403
Diamond mines ..	15,345	14,654	13,378
Totals	222,051	211,808	193,023

TWELVE LEADING COMPANIES.

The mines comprising the twelve leading companies show little material change in their composition and order of production. Apart from the order of rotation there are only two changes, and these are Brakpan Mines, which was twelfth in June, is replaced by the Modderfontein B., and City Deep takes the place of Simmer and Jack for tenth position. The first six of July were the first six of June. New Modder falls from seventh to eleventh, and Robinson Deep goes up from ninth to seventh. The leading dozen mines operated in July 255 stamps and three tube mills less than in June. The tonnage milled was 213,396 less than in the previous month, and value produced £230,716 less. The following are the details of production:—

	Stamps.	Tube Mills.	Tons Crushed.	Value.
Crown Mines	660	24	181,500	£273,333
Randfontein Central	900	29	191,669	237,898
East Rand Proprietary ...	820	25	109,000	175,686
Ferreira Deep	245	6	49,600	104,943
Robinson	250	6	52,900	102,472
Rose Deep	300	7	61,260	74,140
Robinson Deep	200	10	54,300	72,101
Nourse Mines	260	7	47,100	70,572
Geldenhuis Deep	300	7	48,600	70,495
City Deep	150	9	33,700	70,096
New Modder	180	7	30,050	68,732
Modder B.	80	5	27,100	66,542
Totals	4345	143	886,779	£1,386,992

The following returns of the July output have been filed with the Chamber of Mines. Increases and decreases compared with June are subjoined:—

The Witwatersrand.

	June. £	July. £	Inc. £	Dec. £
Aurora West	19,110	17,696	—	1,414
Brakpan	76,637	54,932	—	21,705
Bantjes	36,764	33,791	—	2,973
City and Suburban	50,387	66,082	15.695	—
Cinderella	14,107	3,135	—	10,972
City Deep	72,798	70,096	—	2,702
Crown Mines	285,566	273,333	—	12,233
Consolidated Main Reef	34,725	32,712	—	2,013
Consolidated Langlaagte	63,189	55,233	—	7,956
Durban Roodepoort	15,016	14,417	—	599
Durban Deep	39,296	33,052	—	6,244
E.R.P.M.	254,613	175,686	—	78,957
Ferreira Deep	120,886	104,944	—	15,942
Geldenhuis Deep	83,230	70,495	—	12,735
Geduld	19,143	4,464	—	14,681
Ginsberg	21,523	17,713	—	3,810
Gleneairn	15,878	14,914	—	934
Jupiter	40,268	34,530	—	5,738
Knights Deep	75,495	43,059	—	32,436
Knight Central	29,228	23,558	—	5,670
Langlaagte Estate	58,827	49,040	—	9,787
Luipaardsvlei	19,629	15,899	—	3,730
May Consolidated	13,907	13,639	—	268
Main Reef West	29,513	26,366	—	3,147
Meyer and Charlton	34,016	32,444	—	1,572
Modder B	71,914	66,524	—	5,420
New Kleinfontein	—	55,870	55,870	—
New Goch	26,761	23,018	—	3,743
New Primrose	35,634	33,778	—	1,856
New Rietfontein	17,276	15,347	—	1,929
New Unified	17,500	14,379	—	1,321
Nourse Mines	76,710	70,572	—	6,138
New Modder	87,652	68,732	—	18,920
New Heriot	22,381	20,916	—	1,465
Princess	27,517	25,741	—	1,776
Randfontein Central	281,658	237,898	—	43,760
Robinson Deep	80,647	72,101	—	8,546
Rose Deep	90,396	74,140	—	16,256
Roodepoort United	25,682	22,191	—	3,488
Robinson	102,472	102,472	—	—
Simmer Deep	49,252	40,884	—	8,368
Simmer and Jack	77,211	60,602	—	16,609
Spes Bona	5,921	5,365	—	556
Van Ryn	38,841	34,780	—	4,061
Village Main Reef	65,364	63,159	—	2,205
Village Deep	74,165	52,498	—	21,667
Vogelstruis Estate	15,105	13,746	—	1,359
West Rand Consolidated	42,979	38,523	—	4,456
West Rand Central	3,504	3,645	141	—
Witwatersrand Deep	69,336	63,300	—	6,036
Witwatersrand	49,539	40,231	—	9,125
Wolhuter	37,604	35,753	—	1,941
Miscellaneous	17,651	17,855	204	—

Outside Districts.

Barrett	989	918	—	21
Ceylon Lydenburg	837	1,308	471	—
Glynn's Lydenburg	8,045	8,389	344	—
Nigel	19,786	20,453	667	—
Sheba-Rosetta	956	799	—	157
Sheba	13,444	13,758	314	—
Sub-Nigel	8,997	8,266	—	731
Quest	3,148	2,944	—	204
Trans. G.M.E.	45,960	42,439	—	352
Worcester	5,603	5,327	—	276
Miscellaneous	23,158	21,030	872	—

THE OUTPUT IN DETAIL.

The following is our usual monthly table:—

The Witwatersrand.

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	13,420	80	4,166	£17,696
Bantjes Consolidated	23,900	100	7,955	33,791
Brakpan Mines	39,630	160	12,932	54,932
City Deep	33,700	150	16,502	70,096
City and Suburban	22,000	155	15,557	66,082
Cinderella Consolidated	—	—	738	*3,135
Consolidated Langlaagte Mines	42,850	100	13,003	55,233
Consolidated Main Reef	19,863	100	7,701	32,712
Crown Mines	184,500	660	64,348	273,333
Durban Roodepoort	13,515	90	3,394	14,417
Durban Roodepoort Deep	23,610	100	7,781	33,052
East Rand Proprietary Mines	109,000	820	41,360	175,686
Ferreira Deep	19,600	245	24,706	104,913
Geldenhuis Deep	18,600	300	16,596	70,495
Ginsberg	12,490	80	4,170	17,713
Glencairn Main Reef	19,620	160	3,518	14,914
Geduld Proprietary Mines	6,000	60	1,051	4,461
Jupiter	34,250	120	8,129	34,530
Jumpers-cum-Treasury	—	—	—	—
Knights Deep	61,800	400	10,137	43,039
Knight Central	20,720	120	5,546	23,558
Langlaagte Estate	48,272	200	11,545	49,040
Luipaardsvlei Estate	11,020	60	3,743	15,899
Main Reef West	17,350	100	6,207	26,306
May Consolidated	13,700	100	3,211	13,639
Meyer and Charlton	13,006	75	7,638	32,444
Modderfontein B	27,110	80	15,661	66,524
New Goch	23,600	120	5,419	23,018
New Heriot	11,500	70	4,924	20,916
New Kleinfontein	42,900	200	13,153	55,870
New Modderfontein	30,050	180	16,181	68,732
New Primrose	23,300	160	7,952	33,778
New Rietfontein Estate	14,000	120	3,613	15,347
New Unified	11,320	60	3,385	14,379
Nourse Mines	47,100	260	16,614	70,572
Princess Estate	19,000	60	6,060	25,741
Robinson	52,900	250	24,124	102,472
Robinson Deep	54,300	200	16,974	72,101
Randfontein Central	191,669	900	56,006	237,898
Roodepoort United Main Reef	20,814	50	5,225	22,194
Rose Deep	61,260	300	17,451	74,140
Simmer Deep	52,900	180	9,625	40,884
Simmer and Jack	65,400	320	14,267	60,602
Spes Bona Tribute	5,840	40	1,263	5,365
Van Ryn Gold Mines	28,200	135	8,188	34,780
Village Deep	35,100	180	12,359	52,498
Village Main Reef	33,800	220	14,869	63,159
Vogelstruis Estates	12,538	80	3,236	13,746
West Rand Central	1,933	20	858	3,645
West Rand Consolidated	26,600	100	9,069	38,523
Witwatersrand	32,870	220	9,472	40,231
Witwatersrand Deep	39,670	245	11,902	63,300
Wolhuter	26,800	120	8,417	35,753
Miscellaneous Producers	—	80	4,203	17,855
Outside Districts.				
HEIDELBERG—				
Nigel	13,300	75	4,815	20,453
Sub-Nigel	5,010	25	1,946	8,266
BARBERTON—				
Barrett	—	—	216	918
Sheba-Rosetta	746	20	188	799
Sheba	6,500	65	3,239	13,758
Worcester Exploration	6,100	40	1,254	5,327
LYDENBURG—				
Ceylon Lydenburg	672	5	308	1,308
Glynn's Lydenburg	3,764	20	1,075	8,389
Transvaal Gold Mining Estate	14,700	75	9,991	42,439
KLERKSDORP—				
Quest	3,906	35	693	2,943
Miscellaneous Producers	—	170	5,657	21,030

* Cinderella Consolidated, final clean-up on closing down of battery.

Rand Gold Mines.

Princess Estate and G.M. Co.

The profits of the Princess for the June quarter was £6,149. The footage driven, risen and sunk on the reef and sampled was as follows: South Reef, 1,355 feet, averaging 8·6 dwts. over 25 inches; Main Reef, 625 feet, averaging 7·5 dwts. over 42·6 inches. It is estimated that the payable ore (based on the milling width) developed by the above footage is: South Reef, 33,617 tons; Main Reef, 62,538 tons; total, 96,155 tons. These figures are subject to re-calculation at the end of the year when block values are made out. The directors state: "During the present month, the labour unrest on the East Rand culminated in a general strike, and on the 4th inst. your mine was compelled to close down. With the help of the staff and some men who did not join the strikers, the underground workings were kept dry, and no damage whatsoever was done either underground or on the surface. On a settlement being arrived at with the strikers, work in every department was at once resumed. The loss of time in milling amounted to four days. All work is now proceeding as usual."

Goerz Group.

The following are the results of operations of the crushing mines comprising the Goerz group for the month of July:—

Company		No. of Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated	...	100	—	13,700	£13,605	£3,216
Princess Estate ..	...	60	5	19,000	25,669	348

Geduld Proprietary Mines, Ltd.—The mill re-started crushing on the 16th July. Owing to minor interruptions due to getting the new plant in working order, only 6,000 tons were crushed. No clean-up was made in the cyanide works. The value of yield, together with sundry revenue, amounted to £4,855, and the costs, inclusive of all expenses due to the strike and to the change over to the new plant, totalled £18,734.

The monthly profits for 1913 are:—January, £15,417; February, £10,317; March, £8,551; April, £8,860; May, £9,100; June, £8,959.

Robinson Group.

The following are the results of operations at the Robinson group of mines for July:—

		Tons Milled.	Total Fine Ozs.	Estimated Profit.
Langlaagte Estate	...	48,272	11,545	£11,022
Randfontein Central	...	191,669	56,006	68,524
		239,941	67,551	£79,546

Langlaagte Estate: Estimated profit per ton milled, 4s. 6·80d. Randfontein Central: Estimated profit per ton milled, 7s. 1·80d.

The following strike expenditure is not included in working costs: Langlaagte Estate, £2,000; Randfontein Central, £14,000.

TEMPORARY RESIDENT ENGINEER WANTED.

A Certificated Mechanical Engineer is required for a period of three (3) months from 25th August, to act during the absence on leave of the Mine Engineer. The Mine is situated in the Eastern Transvaal. Apply, stating salary required and enclosing copies of testimonials to—

"T. R. E.,"
c/o S.A. *Mining Journal,*
P.O. Box 963, Johannesburg.

Rhodesian Section.

LATEST MINING NEWS.

The Gold Fields Development Company—Geological Exhibits—Selukwe Columbia—The Wanderer's Report—Mashonaland Agency—Globe and Phoenix—Bulawayo and General.

The report of the Gold Fields Rhodesian Development Company for the 14 months ended March 31 last states that as a result of the operations for that period there is a credit to profit and loss of £67,199, after deduction of all expenses. The state of the market has not permitted of profitable operations, and the above amount, which is mainly derived from dividends on the company's investments, the directors propose to carry forward to the current year.

* * * *

The Rhodesia Museum is making two special exhibits at the present time. One comprises rocks and ores to illustrate the geology and ore-deposits of the Eiffel Flats and neighbourhood, the other consists of specimens to show the association of the gold-ores of this country with a group of acid igneous rocks. These collections are so arranged as to explain the two bulletins of the Geological Survey published by the Argus Co. last week.

* * * *

A report from the company's engineer in Rhodesia shows that the ore in the Yankee Doodle mine will be exhausted in a short time, and the mill temporarily closed down. Development on the Wonderland block of claims is being pushed ahead as rapidly as possible with encouraging results. Indications on this block of claims, as well as on the Danga and Chimborazo blocks, all of which were lately acquired, tend to show that a payable shoot of ore of considerable length will be opened up, and it is hoped, after some further work has been carried out, to erect an aerial ropeway and surface equipment, and again utilise the present reduction plant. The financial resources of the company are quite sufficient to bring these areas to a producing stage.

* * * *

The report of the Wanderer (Selukwe) Gold Mines, Ltd., for the year ended April 30 last, shows that the result of the year's working is a net profit of £11,377, making, with the balance brought forward from the previous year, £19,860 at the credit of the profit and loss account. The tonnage crushed and treated was 222,445, and was the largest quantity dealt with in any one year. The ore reserves at April 30 last were estimated to be 67,931 tons, of which 15,321 tons are pyritic ore in the Ashton mine and not yet amenable to the present treatment. As regards the various sections of the property, the Wanderer itself is now the only section from which further considerable quantity of payable ore is expected.

* * * *

The report of the Mashonaland Agency for the year 1912 states that the company's operations resulted in a profit of £5,503 (against £17,386 for 1911), but the directors have decided that £17,058 should be written off mining claims and investments, thus converting the profit into a loss of £11,555, which amount has been taken to the balance sheet, thereby reducing the amount standing to the credit of the profit and loss account to £11,659. Owing to the conditions of the share market and the low prices prevailing, business has necessarily been greatly restricted, precluding the opportunities of making any considerable profits during the period under review. The directors regret they are unable to recommend the payment of any dividend in respect of the past year. The investments have been brought into the accounts at cost. The market quotations at December 31, 1912, of such holdings as were quoted showed a net depreciation of £22,969, but taking into consideration the various causes responsible for the general market depression the directors consider that such depreciation in values is of a temporary nature only and does not in any instance reflect the intrinsic value of the investment.

Mines Department Exams.

Private Individual Tuition for Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine Drivers' Examinations. Practical Mathematics and Electrotechnics. Correspondence Lessons where personal tuition is impossible. E. J. MOYNIHAN. Consulting Engineer, 35 and 36 Cuthbert's Buildings, corner of Eloff and Pritchard Streets, Box 2061, Johannesburg

* * * *

A circular has been issued to shareholders of the Globe and Phoenix Gold Mining Company, Limited, stating that since the last general meeting Mr. Reynolds and Capt. Lister have resigned, and Messrs. Archibald Bowman and H. H. Haldinstein have been elected to fill their places as directors. Messrs. Pitman, Bowman, and Haldinstein are proceeding to the mine, and the committee appointed by the shareholders inform the board that they do not propose to report to an adjourned general meeting until these gentlemen return to England. Ore reserves: These at June 30, 1913, have been cabled as follows:—"Payable ore reserves, 175,805 tons; average value per ton, 30·8 dwts.; gold contents, 270,739 ozs.; gross value, £1,137,104. In addition to the above, there are on hand the accumulated sands, slimes, concentrates, and residues previously reported."

* * * *

The report of the Bulawayo and General Exploration Company (1906) for the year ended March 31 states that the result of the year's working shows a considerable improvement as compared with the previous year. There is a balance available to the credit of the profit and loss account of £4,021, including £339 brought forward, but excluding a dividend amounting to £2,400 received on certain shares acquired by the company shortly after the purchase thereof was completed, which sum, together with £600 to be transferred from the profit and loss account, making £3,000 in all, the directors propose to place to the credit of an investment reserve account, to be held against any depreciation in the investments, and this reserve is to be increased from time to time as profits may admit.

* * * *

The following information is gathered from the report of the manager of the Pickstone Gold Mines, Limited, for the month of June:—Development footage for month, 152 feet. The average pan values of the month's development work was 12 dwts. over 14 inches. 1,249 tons of ore were crushed, yielding 698·96 ozs. fine gold, value £2,939 1s. 5d., and the working profit for the month was approximately £1,600. The portion of the new plant erected and running continues to give entire satisfaction, and the temporary measures used pending the installation of the balance of the machinery are working well to the duty expected of them. One of the 5 ft. Akron Chilian mills, and the sands portion of the new cyanide plant, should be ready to receive ore by the middle of July, when the tonnage dealt with will be increased by about 50 tons per day, and although the average grade of ore treated will be lower, due to the commencement of operations on the low grade ore from Pickstone West Mine, a substantial increase in the monthly output may be expected. Repeated enquiries have been made regarding the arrival of the electric generator and the electrically driven pumps, but the agents so far are unable to say definitely that this machinery has been shipped.

THE WEEK IN THE SHAREMARKET.

Firm, With No Great Activity—Confidence Slowly Returning.

THE week has been marked by a firm undertone without any great business doing. The London market seems to have got over its nervousness regarding the Rand, and is buying in increasing quantities. All Rand stocks are firmer owing to the demand from the other side, and diamond stocks have had a substantial rise. The statement by Sir David Harris at Kimberley to the effect that operations there may soon be extended is regarded as a "bull" point. The question of the moment is how native recruiting for the Rand will progress. Reports are satisfactory on this score from the outside districts, and the efforts of recruiters are proving fairly successful. It is only a matter of time before operations on the mines can be restored to their pre-strike level. The fluctuations in prices during the week are not very striking.

	Fri., 13th.	Sat., 9th.	Mon., 11th.	Tues., 12th.	Wed., 13th.	Thurs., 14th.
Adair Ushers ..	0 6B	0 6B	0 6B	0 6B	0 6B	—
Afrcian Farms ..	15 0	15 0B	14 6	15 0	15 0	14 9B
Apex Mines ..	20 0s	19 0	18 0B	18 0B	19 0	19 0s
Bantjes Cons. ..	15 6B	16 6B	16 3B	16 9	16 6B	16 6B
Benoni Cons. ..	2 3B	3 0s	2 6B	2 9s	2 6s	2 6s
Brakpan Mines ..	—	60 0B	—	60 0B	60 0B	—
Breyten Collieries..	25 0B	25 0B	25 0B	25 0B	25 0B	27 0B
British S.A. ..	—	19 9B	—	19 6B	—	21 0
Bushveld Tins ..	—	1 0s	1 0s	0 6B	0 9B	0 9B
City & Subs. (£4) ..	44 0	43 9B	—	43 6B	43 0B	42 0B
City Deeps.. ..	53 0B	55 6	55 0	55 3B	56 0	55 6
Cloverfield Mines ..	4 3B	—	4 3B	4 3B	4 0B	4 1B
Clydesdale Colls. ..	—	—	8 0B	—	8 0B	—
Cons. Langlaagtes	25 0B	25 0	25 0B	26 0s	25 6B	25 0B
Cons. Main Reefs ..	17 0	17 9	17 6B	17 3B	17 3B	17 3B
Coronation Freeholds	—	0 5B	—	0 5B	—	0 5B
Coronation Synd.	2 0B	—	—	2 6B	—	—
Crown Diamonds ..	10 3B	12 3	12 0	—	10 3B	10 0B
Crown Mines (Deb.)	£90B	—	£95B	—	—	—
East Rand Centrals	8 0B	7 9B	7 9	7 9B	7 9B	7 6B
East Rand Coals (2/6)	1 3B	1 10B	1 11B	1 11	1 11B	1 10B
East Rand Deeps..	1 7B	1 7	1 6B	1 6B	1 6B	1 6B
East Rand Props.	47 6B	48 6B	48 6B	49 3B	49 0B	49 0B
East Rand Debs.	£90B	£90B	£90	£91s	—	—
Eastern Golds (1/-)	—	—	1 4	1 3B	1 3B	1 3B
Frank Smith Diam.	10 6	10 0	9 6	9 9B	8 3	8 3
Geduld Props. ..	20 6B	21 3	20 6B	21 9	—	21 0B
General Minings ..	—	—	—	—	—	13 0B
Glencairns	2 0B	—	—	—	2 6s	—
Glencoe (Natal) Colls.	7 0B	7 3B	7 3B	7 3B	7 3B	7 3B
Glynn's Lydenburgs	14 0B	—	—	—	13 6B	—
Government Areas	20 0B	20 3	20 0	20 6	20 9	20 3B
Hex River Expls.	0 3	0 2s	—	—	—	—
Jumpers	—	—	—	—	2 6B	—
Jupiters	—	5 6	5 6	4 6B	6 0s	5 3B
Kaalfontein D. (2/6)	0 4B	—	0 3B	—	0 3B	—
Klerksdorp Props...	2 4B	2 4B	2 3B	2 3B	2 0B	2 0s
Knight Centrals ..	8 6B	8 6	8 0B	8 3B	8 3	8 9s
Knights Deeps ..	—	—	—	—	35 0B	
Lace Props. ..	3 0B	3 1B	3 1B	3 1B	3 1B	3 1B
Lydenburg Gold Fms.	3 0B	3 0B	3 0B	3 3s	—	3 0
Main Reef Wests ..	9 0B	9 0B	9 0B	8 6B	8 0B	8 9B
Main Reef West Debs.	—	£60B	£60B	—	—	—
Meyer & Charltons	—	—	—	100 0s	—	—
Middlevlei Estates	1 0B	1 0B	—	1 0B	1 0B	1 0B
Modder B's ..	75 0B	76 6	77 0s	76 0B	76 0B	76 0B
Modder Deeps ..	28 6B	28 9B	28 6B	28 6B	28 0B	28 3B
Natal Navigation Col.	14 0B	14 6B	14 6B	14 6B	14 6B	14 9B
New Boksburg ..	—	—	0 6B	0 6B	—	0 6B
New Era Cons (5/-)	7 0B	7 0B	7 0B	7 0B	7 0	—
New Geduld Deeps	1 11B	1 11B	2 0B	2 0	—	—
New Kleinfonteins	—	19 0B	20 0s	19 0B	18 6B	19 0B
New Rietfonteins	—	4 0B	4 6B	—	—	—
New Unifieds ..	14 3s	14 3s	14 3s	14 3s	14 3s	12 6B
Nigels	17 0B	—	16 6B		—	—
O.F.S. & Trans. Dia.	1 7s	1 4B	1 4B	—	1 4B	1 3B
Pickstone Golds ..	—	—	—	—	42 6s	—
Premier Def. (2/6)	—	—	—	225 0B	—	—
Premier Pref. (5/-)	—	170 0B	—	170 0B	170 0B	170 0B
Pretoria Cement Co.	48 6B	48 6B	48 6B	48 6B	48 6B	48 6B
Princess ..	4 6B	4 9B	4 6B	5 0B	5 0	5 0B
Rand Collieries ..	—	—	2 6B	2 6B	3 6B	—
Rand Klips ..	1 6s	1 5B	1 0B	1 5	1 4B	1 0B
Rand Nucleus ..	—	2 0B	—	2 0	—	—
Randfontein Deeps	3 6	3 5B	3 6B	—	—	—
Randfontein Estates	26 0B	26 6	25 9B	26 6B	27 0	27 0B
Roberts Victors ..	29 6B	31 0B	30 0B	31 0B	30 0B	30 0B

	Fri., 13th.	Sat., 9th.	Mon., 11th	Tues., 12th.	Wed., 13th.	Thurs., 14th
Robinson Deeps	31 6B	—	—	—	—	—
Rooiberg Minerals	29 3	29 3B	29 0	—	28 6B	28 6
Rood. Durban Deeps	—	22 0s	—	22 6s	22 6s	22 6s
Salisburys ..	—	—	1 6s	1 6s	1 6s	—
Shebas	5 6B	—	4 9B	4 9B	—	5 0B
Simmer Deeps ..	—	—	—	2 6B	2 6B	2 6B
S.A. Breweries ..	39 6B	39 6B	39 6B	39 6B	39 6B	39 6B
S.A. Lands ..	3 2B	3 2B	3 2	3 2	3 0B	3 1
Springs Mines ..	15 9B	16 0B	16 0B	17 0	16 6B	17 0B
Sub Nigels ..	9 3B	9 6B	9 9B	10 3B	10 6	10 0B
Swaziland Tins ..	40 0B	42 0B	42 6B	—	—	—
Trans. & Delagoas	35 0B	—	35 0s	—	35 0B	35 9B
Trans. Coal Trusts	35 6B	35 6B	35 6	35 6B	36 0B	36 3
Trans. Cons. Lands	—	—	—	22 0B	—	—
Trans. G.M.Estates	51 6B	51 6B	51 6B	51 6B	52 6s	51 6B
Van Ryn Deeps ..	30 3B	30 6	30 3	30 3B	30 3	29 9B
Village Deeps ..	—	38 9B	40 0	40 0s	40 0s	—
Vogel. Cons. Deeps	—	—	—	1 0s	—	0 6s
Witbank Collieries	41 0B	41 0B	41 6B	41 6B	42 0B	42 6B
Witwater rands ..	63 6B	64 6	65 0s	64 0B	65 0B	66 0B
Wit Deeps ..	52 9	52 6B	52 6B	53 0B	53 9	53 6B
Wolhuters	13 3B	14 0	13 0B	13 6B	13 9B	13 6B
Zaaiplaats Tins ..	38 0	38 9	37 9	38 9	39 9	39 0

B Buyers. S Sellers.

East Rand Proprietary Mines.

The following are the results of last month's operations at the East Rand Proprietary Mines:—820 stamps milled 109,000 tons; 41,360 ounces of fine gold recovered; value, £173,805; profit for the month, £47,126. In the above are included the following results of the accumulated slime treatment: 1,118 ounces of fine gold recovered, value £4,700; profit for the month, £3,028. From the above profit must be deducted strike expenditure amounting to £19,574, leaving net profit, £27,552, as compared with £92,007 for June. The directors have declared a dividend of 12½ per cent. for the half-year ended June 30, 1913, payable to shareholders registered on August 14.

Luipaardsvlei Estate.

The following is the result of operations for the month of July:—60 stamps ran 24·522 days, crushed 14,020 tons, yielding 1,651 ozs. fine gold. Three tube mills ran 25·252 days, yielding 614 ozs. fine gold. Sands treated, 9,950 tons, yielding 1,078 ozs. fine gold. Slimes treated, 4,070 tons, yielding 400 ozs. fine gold. Profit from operations, £650, after deducting £694, strike expenditure. Sundry revenue, £900; working costs per ton, 24s. 6d.; total working expenses, £15,072 10s.

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Compressing Plant by Walker Bros., Wigan.

Steam Cylinders, 30 in. and 50 in.; Air Cylinders, 29 in. and 44 in. by 5 ft. stroke.
Piston Rods 5¼ in. diameter steam, Air 4¾ in. diameter, Crank Pin 7 in. by 9 in.
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Slide Valves on Steam Cylinders, with Meyer Expansion Gear.
Air Cylinders, Cast Steel Valves, of the Walker Higged Gear.
Bedplates of Box Section, with Adjustable Pedestals for support of Crank Shaft.
"Jet" Condenser, with Brass Fitted Edwards' Air Pump, 28 in. diameter by 28 in. stroke, this being driven through Bell Crank Level from Tail Rod behind L.P. Air Cylinder in conjunction with Circulating Pump 12 in. diameter by 24 in. stroke, for supplying water for Inter-cooler and Air cylinder Jackets.
Steam Pressure 70 80 lbs. per square inch.
Air Pressure, 70 lbs. per square inch.

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Engineering Notes and News.

Steel for Rock Drills.

The Mines Trials Committee, of Johannesburg, has published a pamphlet containing a report of investigations on rock-drill steel made by Robert Allen. The object of the investigation was to determine the most suitable steel for use on the Rand and to standardise its heat-treatment. The steels tested were all of sizes suitable for use with small-piston machines. The drills were standardised with regard to their length and to the shapes of the bits. Drawings of the latter accompany the report. The steels were classified according to the weight lost in drilling, to the loss of reaming efficiency, and to the general appearance of the bits after use. It was formerly accepted as an axiom that high-carbon steels were the most suitable for rock-drills, but Mr. Allen claims that while both these and alloy steels require a more complicated heat-treatment, their drilling results were no better than those of the ordinary medium-carbon steels. Low-carbon steels were eliminated for obvious reasons, and from the ordinary medium-carbon steels were eliminated those that possessed undesirable tendencies, such as flaking, chipping, splitting, undue wear, or if they were generally treacherous. From the analyses of the most efficient steels remaining were deduced formulas for the compositions of the most suitable steels for rock-drill purposes. In these formulas the carbon content varies inversely with the size of the steel as follows, this being one of the most interesting discoveries of the investigation :—(a) Larger than $1\frac{1}{2}$ in. cruciform, or steel weighing more than $5\frac{1}{2}$ lb. per foot run, from 0.60 to 0.65 per cent. ; (b) $1\frac{1}{2}$ in. cruciform, or steel of equivalent weight, from 0.64 to 0.69 per cent. ; (c) 1 in. octagonal, from 0.67 to 0.72 per cent. ; (d) $\frac{7}{8}$ in. octagonal, from 0.70 to 0.75 per cent. The quantities of silicon, phosphorus, sulphur, and manganese recommended are the same for all sizes of steel, and are as follow :—silicon between 0.05 and 0.15 per cent. ; manganese between 0.25 and 0.35 per cent., the total manganese and silicon content not to exceed 0.40 per cent. ; total phosphorus and sulphur not over 0.035 per cent., the less the better ; alloying element none, except that aluminium might be used as a purifier so long as, in the finished steel, the amount did not exceed 0.10 per cent. As there appeared, from the experiments, to be no practical difference between steels of the same chemical composition, whether made by the open-hearth, the crucible, the Swedish Bessemer, or the electric crucible processes, the method of manufacture was optional. Hammered (or tilted) steel showed no superiority over rolled, therefore for rock-drill purposes the expense of hammering might be avoided. For the heat-treatment in the forging and sharpening of drill-bits, oil furnaces were found to be superior to coal forges, and an oil-furnace, specially designed by Mr. Allen, was found to give better results. We intend to give details of this furnace in a later issue. The steels of the compositions recommended above can be heat-treated in a comparatively simple way, which makes a separate tempering operation unnecessary. This method is recommended, and is here given *in extenso* :—(1) The drills, properly cleaned, are heated to an orange-red heat, at about 1,050 deg. C., this heat extending a short distance along the drill from the cutting edge about $1\frac{1}{2}$ in. for a hand drill, 2 in. for a medium-sized machine drill, and 3 in. for a large machine drill. (2) The heated drill is then forged by rapid hammering and dollying, until it has reached a dull red colour—about 600 deg. C.—the work proceeding as quickly as possible. This operation for a medium machine bit should take from about 45 to 60 seconds. (3) The bit, without letting it cool further, is put back into the furnace and re-heated to a bright red colour—about 950 deg. C.—the heat extending along the bit the same distance as before. (4) It is then sharpened and made to gauge, the hammering proceeding strongly and rapidly, until the bit has reached a cherry red colour—about 750 deg. C.—the colour extending, in the case of a medium machine bit, when it is quenched. This operation with a medium machine bit —in the hands of a good tool-smith accustomed to gauging—will take about 45 seconds. Bits made of $1\frac{1}{2}$ in. cruciform steel or larger should be quenched by standing them vertically on a knife-edge support in the water in the quenching bath, so that the drills stand in from $\frac{1}{2}$ to $\frac{5}{8}$ in. of water. Smaller bits may be quenched by plunging them vertically into the water, and keeping them moving around in a vertical position for five or six seconds, and then standing the drills on the false bottom of the quenching bath and leaving them there until they have become of the same temperature as the water. The removal of a drill from the quenching bath before it is quite cold is liable to produce fracture. Mr. Allen gives the dimensions and arrangements of a suitable quenching bath, and he recommends the use of a thermo-telegraph mercury thermometer to help in the regulation of the temperature of the water in the quenching bath, the indicating dial attached being graduated from 0 deg. to 40 deg. C. The success of the sharpening operations depends very much upon this piece of apparatus.

The standardisation of the shapes of bits, and the gauging of the bits in both directions, when sharpening drills, are considered important. The expense of sharpening is slightly increased, but this is offset by many advantages : the rate of drilling is increased ; the miner's waste of time in selecting drills that he thinks will follow one another properly (but often don't) is avoided ; the chance of "fitchering" or deflection of a drill by "slips" in the rock is reduced ; also, when the reaming is good, the drill-holes can be drilled more cylindrically and explosives used more economically. All the bits used during the experiments were made and sharpened by hand, and it is to be regretted that the investigations did not embrace experiments in the use of machine-sharpened drills, which are automatically gauged. It is pointed out that by close attention to what are usually considered trivial matters many economies can be gradually effected. When the steel is of suitable composition, lighter drills can be used to bore holes of the same depth ; this, in turn, allows the use of lighter drilling machines ; less steel has to be handled and sharpened ; less compressed air is needed. Incidentally, it might be noted that the use of lighter drilling machines lessens the number of machine-boys required. The report contains a number of appendices giving definitions of technical terms used, notes on the heat-treatment of drill steel, drilling results obtained when testing the steels, remarks on the influences on steel of various chemical elements, dimensions for the best sections for cruciform steel, data obtained by mechanically testing some of the steels, and the method recommended for the sampling of parcels of drill steel for analysis.

* * * *

New Cape Railway.

Apropos of the opening of the George-Oudtshoorn line, the South African Railways has issued an interesting souvenir booklet dealing with the country through which passes the line linking up the East and West Cape Province. In this we are informed that the George-Oudtshoorn line,

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as an engineering achievement, will be hard to beat, and stands as a creditable monument to South African Railway enterprise. It will form an important connecting link in the South African Railway system, as it will provide a through coast route in the Cape Province from Capetown to Port Elizabeth, via Worcester, Mossel Bay, Oudtshoorn. and Klipplaat. The distance by rail from Capetown to Oudtshoorn will be reduced from 910 to 420 miles, and to Port Elizabeth from 939 to 697 miles. The port of Mossel Bay will also be given railway communication with its natural hinterland, and considerable development may be expected. The districts of George, Knysna and Mossel Bay will be accessible from the Midlands and Northern portions of the Union, via Rosmead Junction and Graaff-Reinet, and large numbers of visitors will no doubt be attracted by the great natural advantages of these districts, containing as they do some of the finest forest and mountain scenery in South Africa, many beautiful seaside resorts, good roads. and last, but by no means least, the only lake district in Southern Africa.

Air Cylinder Lubrication.

With reference to graphite powders and oils for use on Air Compressors, and also referring to our article on Air Cylinder Lubrication in our Engineering Notes and News of the 26th July last, a correspondent writes:—"We would like to bring to your notice the following points bearing on the above article which might be worthy of the consideration of your numerous readers amongst the engineers, etc., along the Reef. The Graphite Oils Co., Ltd., of Glasgow, whose sole agents here are Messrs. Selcraig's (Colonial), Ltd., are strongly against the use of oil in any form in the air cylinders of compressors, and to get over this difficulty they have manufactured a dry impalpable-deflocculated-airblown-graphite powder, specially prepared for this purpose. They recommend that this dry graphite powder should be inserted in small quantities through the compressor suction inlet, and insist that the whole question of the lubrication of this part of the machinery is thereby solved. This method makes for entire safety and security from accidents, there being no danger of explosion through the accumulation of oil deposits, and no possibility of valves or cylinder faces being jammed by a carbon deposit with this form of lubrication. Another point in its favour is that it does not contaminate the compressed air which is conveyed and distributed to the various machines underground, the exhausts from which machines frequently vitiate the atmosphere of the mines. If the user insists on oil, then the Graphite Oils Co., Ltd., supply an oil in which they claim to have graphite in perfect suspension. They manufacture oils for all purposes in which this graphite powder is permanently suspended, and this they claim adds considerably to the lubricating efficiency, and shows a great saving in the quantity required as against ordinary oils. These various products are now being used on mining properties both here and in Rhodesia, and in every case are giving entire satisfaction to the users."

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Finance, Commerce, and Industries.

Union's Commercial Progress.

The American Department of Commerce publishes a review by Consul Gunsaulus (Johannesburg) of the commercial progress of the Union in 1912, which fully bears out what has already been said on the subject in these columns. The following are extracts from the report:—Steady and substantial progress in the volume of trade and a distinct advance in the general prosperity of the country characterised the year 1912 in the Union of South Africa, despite the fears expressed in some quarters that, following a period of exceptional commercial activity, a retrograde movement might be expected. Mining and agriculture, the mainstays of commercial progress in the Consular district of Johannesburg, and the two industries upon which depends at present the general prosperity of British South Africa, both made material advancement during 1912. As a result, the trade of the country, especially of the Transvaal Province, which is the centre and principal source of the Union's commercial activity, showed a material increase both in imports and exports over that of the preceding year. For the first time in five years the value of the imports of merchandise into the Union of South Africa from the United States exceeded that of Germany, placing the United States second to the United Kingdom as an exporting country to the Union. While there are no statistical figures separately dealing with the imports and exports of the several Provinces of the Union, the Transvaal, by reason of the importance of the gold-mining industry and the enormous resultant demand of the Rand for products of all kinds, plays a leading part in the import and export trade of B.S.A. Each succeeding year marks an advance in the volume of the business done, despite the fact that for the last year or two there has been a diminishing demand for mining machinery caused by a temporary cessation of new construction work by the mining groups. There has been an increased demand, however, for agricultural machinery and implements, water-boring machinery, motor-cars and motor-cycles, windmills, brass and copperware, etc. The general prosperity of the country is shown in the earnings of the railways, which continue to increase, keeping pace with the country's development. Some time in the future it is likely that agriculture and stock raising, which are steadily gaining ground, will constitute the chief basis of South Africa's progress and prosperity, but for the present the mineral resources of the country, especially the goldfields of the Transvaal, easily stand first in importance, as they are likely to do for the next few decades. To the gold-mining industry alone can be attributed the marvellous growth of the Rand section of the Transvaal, with its big urban population, constituting the leading market of South Africa for both home and foreign products, and to this industry also is due in a great measure the success and prosperity of the railways of the country. It is the source of the great bulk of the country's exports, and contributes more largely, directly and indirectly, than any other agency to the revenues of the Government. Much greater interest is manifested by farmers and encouraged by the Department of Agriculture in irrigation and dry-farming methods—two systems which are well adapted to agriculture in South Africa. The proper conservation of the rainfall and of the water in the streams for irrigation purposes is taking a deep hold on the farming community and others interested in the advancement of agriculture, and the agitation of this question is likely to lead to the adoption of some definite system of water conservation in the near future. Much more attention is paid to the importation and breeding of good strains of cattle, sheep, and other livestock, while there is also a growing disposition on the part of agriculturists to adopt the newest and most approved methods of farming, including the purchase of farm machinery and implements of modern types. The tendency is to divide farms of 6,000 and 8,000 acres into holdings of 1,000 to 2,000 acres, which means a closer settlement than has heretofore been possible, the cultivation of a larger acreage of crops, and more attention to intensive cultivation of those areas. With this increase in rural population the farming community is faced with a comparative scarcity of farm labour, and there is a growing tendency to use more labour-saving agricultural and domestic machinery. Building operations in the principal cities and towns of the Transvaal, which were conducted on a large scale during 1911, showed even greater activity during last year, especially in Johannesburg and other centres of the Rand.

* * * *

Rand Trade Unions.

At the end of the year 1912, says Mr. R. Shanks, the Inspector of White Labour in Johannesburg, in his annual report, the thirteen trade unions sending in returns had a total membership of 9,944, an increase of 2,006 over that of the year 1911. Their number out of employment at the end of December, 1912, was 457—4·59 per cent., being 1·97 per cent. in excess of that of the previous year. Nearly 50 per cent. of the trade union members unemployed at the 31st of December belonged to four unions—the engineers, the engine-drivers, the boilermakers and the iron-moulders. These four unions had 225 of their members unemployed at the end of the year, while their membership fell off during the year to the extent of 212. Even these figures do not represent to the full extent unemployment in the unions, as there is always a number of men who do not report themselves immediately they lose a job. The large construction works recently completed, and possibly the extension of electrical power to the mines, have contributed to the changed conditions mentioned.

* * * *

" Back to the Land."

Senator Colonel Byron, speaking at the Unionist Club last week on " Back to the land, and how to get there," said they lived in South Africa in the fancied security of being self-supporting, a fancy that had been overshadowed by the very remarkable events of the last few weeks. There was no doubt the experience they passed through had greatly shaken the credit of South Africa and the stability of the country. They had seen incidents of bloodshed, violence, and arson that were too suggestive a lesson for the natives to be viewed with equanimity by the whites. The whole question had a national aspect. The workers, on the whole, were discontented. A remarkable thing was that the workers in this country were in a rather better position as regard wages, and in the roughest form of work done by natives, than the workers were in many parts of the world. After referring to the complaints of the workers, without attempting to analyse them, he said their apparent prosperity had been due to the time-honoured plan of the spendthrift living on capital. They had been steadily diminishing in national assets in the form of minerals, and there had been no allocation of the profits or receipts from those assets towards developing the permanent interest of

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the country. Until a radical change was made in that policy, they were not going to do much good in the country. According to an official report, up to May 31 last the enormous number of 36 men had been placed on the land under the Settlement Act of last year. All the talk about "poor whites" was simply what Americans called "hot air." Not one poor white had been placed on the land during that time. Colonel Byron maintained that "back to the land" would solve a great many problems and strengthen the country immensely. After all, the true wealth of the country was what was produced on the land.

* * * *

Industrial Disputes Act.

Under the Industrial Disputes Prevention Act, says Mr. H. Warington Smyth, the Secretary for Mines, in his report to the Minister of Mines on white labour for last year, an important dispute between certain mining companies and their employes was referred during the year to a Board of Conciliation and Investigation. The details and the objects of the Transvaal Act, which is based on the similar Canadian Act, seem to be still very little known or appreciated. The Canadian Act has been recently reported on by Sir George Askwith, the Chief Industrial Commissioner of Great Britain, in a report to the Board of Trade which was presented to both Houses of Parliament, and it is evident that increasing attention is being paid in other countries to the principles underlying the Act. It is interesting, therefore, to remember that the Transvaal Parliament passed an Act based on the principles of the Canadian legislation as long ago as 1909.

* * * *

Six Months' Trade.

With the monthly statement for June, compiled by the Statistical Office of the Department of Customs, the material is provided for a survey of the trade of the Union during the first half of the current year. Its feature is that, in spite of the prolonged drought of 1912, which might have been expected to make its influence severely felt during at least the early months of 1913, by decreasing the purchasing power of the country, importations have remained at a high level, while exports have grown by very much more than four millions sterling. The actual figures for the six months are as follows:—Imports: 1913, £20,390,936; 1912, £19,081,391; increase, £1,309,545. Exports: 1913, £34,683,872; 1912, £30,455,226; increase, £4,228,646. Thus imports have increased by nearly 7 per cent. and exports by over 13 per cent. Leaving articles of food and drink out of account, it appears that the total imports during the two six-month periods amounted to £16,539,072 in the present year, and £16,301,795 last year. Further analysing the import figures, we may print a table showing directions in which there have been noteworthy changes in the period under review.—Six months' imports: Corn and grain: 1913, £1,102,317; 1912, £399,802. Butter, etc.: 1913, £150,000; 1912, £98,000. Cheese: 1913, £87,416; 1912, £71,768. Lard: 1913, £40,692; 1912, £19,054. Sugar: 1913, £143,818; 1912, £105,051. Motor cars: 1913, £462,696; 1912, £226,093. Motor bicycles: 1913, £111,487; 1912, £44,808. Haberdashery: 1913, £615,592; 1912, £689,207. Woollen goods: 1913, £496,659; 1912, £564,637. These are a few selected articles or classes of goods imported which are a key to the general trade situation. The motor import business continues to show very rapid expansion, but in most categories the trade of last year has been either just maintained or has shown a slight decline. The export side of the account shows a 13 per cent. increase on the previous year, the actual excess of South African produce exported being £4,228,646. Of this increase, the mineral output of the Union accounts for £3,119,000. The export of diamonds has grown from £4,135,000 in the first half of 1912 to £6,188,000 in the current year. The gold export has increased from £18,837,000 to £19,563,000. The copper export is 150 per cent. better than in the previous year. The tin export has nearly doubled, and now amounts to the very respectable value of £185,000 for the six months, with every prospect of a substantial increase in the near future. The quantity of coal exported shows a growth of 42 per cent., though the value obtained per ton has fallen from 14s. 9d. to 12s. Apart from the mineral output, the exports of other South African produce have grown in value from £6,656,000 in the first half of 1912 to £7,765,000 in the current year, or by 18 per cent. We reproduce the figures relating to the more important articles: Six months exports: Wool: 1913, £3,170,103; 1912, £2,436,802. Ostrich feathers: 1913, £1,592,720; 1912, £1,323,091. Mohair: 1913, £464,076; 1912, £410,375. Hides and skins: 1913, £997,693; 1912, £694,835. Corn and grain: 1913, £52,758; 1912, £186,872. Fish, dried and preserved: 1913, £46,316; 1912, £31,748. Fruit, fresh, 1913, £36,773; 1912, 47,385. On the whole the export returns are distinctly satisfactory, the enormous increase in the output of wool, in spite of the drought, being one of the most remarkable features of the returns.

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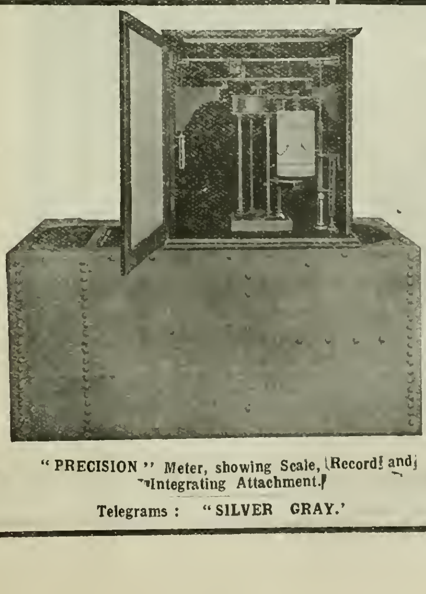

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Automobile Notes.

The rapidity with which the farming community in the outlying districts of the country is taking into favour the new means of rapid transit is, we hope, a sign that the neglected roads or tracks in those distant parts may receive a little of the attention they have so long been denied. The way in which the modern motor car stands up to work it was never intended to cope with is a great tribute to the excellence of material and design, but there is no doubt that this is only accomplished at the sacrifice of a considerable portion of its running life.

* * * *

The members of the African motor expedition arrived in Capetown last week prior to starting on their long motor car journey to Cairo. The party consists of six under the leadership of Captain R. N. Kelsey, and includes two big game hunters, a special correspondent to the *Daily Telegraph*, a cinematographer and a mechanic. The objects of the expedition are: Big game hunting, cinema films and general exploration.

* * * *

The party comes highly accredited and is receiving assistance from the Automobile Association, the War Office, the British South Africa Company, and the Railway Administrations of South Africa. Before leaving England, the members had an interview with His Majesty the King at Buckingham Palace Gardens, where the outfit was inspected.

* * * *

The car has been supplied by the Argyll Company, and is a standard 25-50 h.p. 4-cylinder chassis, with sleeve valve engine, fitted with a special body made of pressed steel. The latter consists of two shells fitting, when on the chassis, one in the other. These can be lifted off bodily and bolted together, end to end, so as to form a small pontoon with which rivers may be crossed and the impedimenta ferried over. The petrol tank holds fifty gallons of spirit, and further supplies have been arranged for by the establishment of depots at convenient intervals along the proposed route.

* * * *

The intention is to pass through the chief towns in South Africa to Bulawayo, and to travel thence via Victoria Falls, Fort Rosebury, Abercorn, Udjidji, Tabora, Bukoba, Entebbe, Hoima and Khartoum to Cairo. The journey will probably take about eighteen months to accomplish.

* * * *

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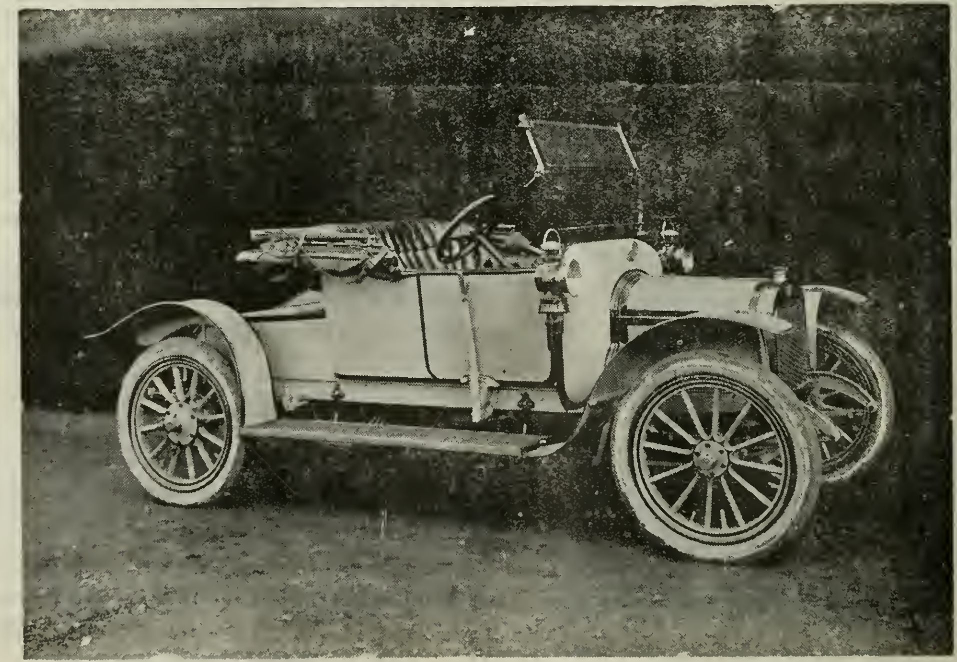

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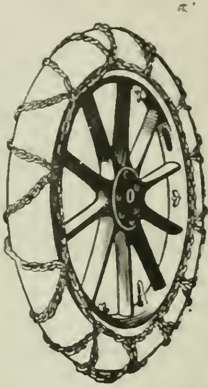

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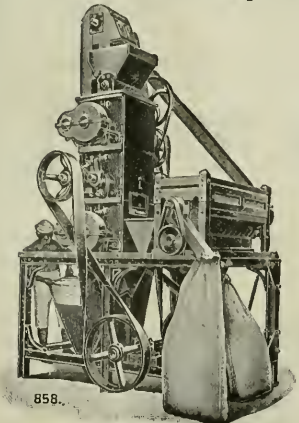

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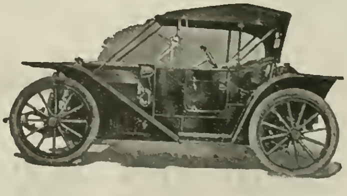

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total of 213 miles. The circuit included three of the most severe hills in England. The longest, Porlock Hill, which has a gradient in parts of 1 in 4, rises in 2½ miles to the height of 1,260 feet. Beggar's Roost Hill is the steepest, and, with gradients in parts of 1 in 3½, rises 400 feet in about half a mile. The most severe hill on the circuit, owing to its loose surface, is Lynmouth Hill, rising approximately 600 feet with gradients of 1 in 4, and containing many hairpin bends. The severity of this hill may be realised from the fact that an elevator is maintained there for the purpose of taking cars up to the top.

* * * *

The test was conducted officially under the Open Competition Rules of the R.A.C., and the certificate issued by that body states that the petrol consumption was 17·3 miles to the gallon over the whole course, and that the test, which was without involuntary stop, was preceded by a speed trial on Brooklands track, where a speed of 57·66 miles per hour was attained.

* * * *

In connection with the tar-treatment of roads, a useful circular has been issued by the Roads Improvement Association, in which the following hints are given for the removal of tar stains from clothing, paint work, etc.: "Tar stains can best be removed from clothes by softening the tar with any form of grease, such as butter, and afterwards removing with benzole. Tar stains on the hands or skin can be removed with benzole. A very convenient soap for dealing with tar stains on woodwork or paintwork consists of equal parts of soft soap and benzole. The mixture, however, tends to separate and must be frequently beaten up into a cream.

* * * *

The economic value of a reliable speedometer can only be properly appreciated by one who, having become accustomed to its use, has been suddenly deprived of it. It is not merely in indicating the speed of the moment that its chief value lies, though that is an important function in countries where speed limits abound. The wear and tear on tyres may be checked through the distance indicator, the maintenance of efficient lubrication provided for through the reminder of the distance run, and gear changing in a strange country may be timed to a nicety through this infallible guide.

* * * *

Demands, however, we are pleased to observe, are becoming more insistent for a standardised form of speedometer drive which will simplify and cheapen the fitting of these devices. The system which offers the best advantages in this direction appears to be one that would take the drive through a flat belt from the cardau shaft, and manufacturers would do well to take early cognisance of this requirement on the part of their customers.

New Heriot G.M. Co.

The New Heriot Company's returns for last month's operations were as follows:—Tons milled, 11,500; ounces recovered, 4,924; profit, £7,255.

Consolidated Main Reef.

Revenue £104,285 0s. 2d., or £1 9s. 7·694d. per ton from 70,365 tons milled; cost £71,456 6s. 8d., or £1 0s. 3·722d. per ton; profit £32,828 13s. 6d., or 9s. 3·972d. per ton; yield, mill 19,853·693 fine ozs., cyanide 4,986·795 ozs.; capital expenditure, £29,872 15s. 9d.; development work, 3,623 feet. Assay values: Excluding main crosscuts and ore passes, 2,718 feet, or 80·9 per cent., has been on reef. Of this, 1,689½ feet, or 62·2 per cent., has been payable, of an average value of 8·5 dwts. over 48 inches; and 1,028½ feet, or 37·8 per cent., is unpayable, of an average value of 3 dwts. over 48 inches. Of the payable portion, 1,484½ feet, or 87·9 per cent., has been on Main Reef Leader, of an average value of 8·8 dwts. over 48 inches; and 205 feet, or 12·1 per cent., has been on South Reef, of an average value of 7·2 dwts. over 48 inches. Since the close of the quarter (June), a general strike occurred on the Witwatersrand. The greater portion of the underground European employees in the mine went out on July 4 and returned on July 8. Work has since been resumed on a normal scale. Pumping was carried on during the strike, and no damage was done to the property.

Main Reef West.

Revenue £90,783 12s. 7d., or £1 9s. 4·529d. per ton from 61,805 tons milled; cost £70,406 3s. 6d., or £1 2s. 9·400d. per ton; profit £20,377 9s. 1d., or 6s. 7·129d. per ton; yield, mill 16,038·932 fine ozs., cyanide 5,609·490 ozs.; capital expenditure, £8,697 13s. 10d.; development work, 3,922 feet. Assay values: Excluding No. 4 shaft, main crosscuts, ore passes and prospecting work, 2,657 feet, or 77·2 per cent., has been on reef. Of this, 1,320 feet, or 49·7 per cent., has been payable, of an average value of 6·2 dwts. over 48 inches; and 1,337 feet, or 50·3 per cent., has been unpayable, of an average value of 3·2 dwts. over 48 inches. Of the payable portion, 1,284½ feet, or 97·3 per cent., has been on Main Reef Leader, of an average value of 6·3 dwts. over 48 inches; and 35½ feet, or 2·7 per cent., has been on South Reef, of an average value of 5·7 dwts. over 42 inches. The same remarks are made about the strike as in the preceding report.

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Notes and News.

Position of the Van Ryn Deep.

The output analysis sheet for the month of August will include the name of a new and important Further East Rand producer in the Van Ryn Deep. At present 65 stamps are dropping, and the new plant is running smoothly and satisfactorily. Underground the development position generally leaves little to be desired, and the prospects of this concern may be regarded as distinctly bright although operations for the present are considerably hampered by insufficiency of native labour. The output to be announced on the 10th of next month will be in respect of the August operations and a portion of July, but as is only to be expected in connection with the starting up of a new plant there will be considerable absorption of gold by the plates and a further amount will be in circulation. Milling operations were just commencing when the strike occurred, and the formal dropping of stamps did not take place until the middle of July. It is satisfactory to learn that the actual cost of the equipment is coming out well within the bounds of the capital expenditure estimated.

* * * *

Bwana M'Kubwa Copper.

A circular has been issued to shareholders stating that the board recently engaged Mr. S. J. Speak, of Messrs. Hooper, Speak & Co., consulting engineers, to visit the mine and report upon the present operations and to submit such recommendation as would enable the board to decide as regards future policy, Mr. Speak has now returned and has made a preliminary report, dated the 22nd inst., a copy of which is annexed to the circular. The board has decided to continue operations for the present. but to reconsider the whole position on receipt of the completed report.

* * * *

Rand Shaft Equipment.

According to the Government Mining Engineer, in his recently-issued annual report, a point that has considerable bearing on the question of health in the Witwatersrand mines is that of shaft equipment. He points out that on many properties the shafts were originally designed for a much smaller crushing capacity than they are now called upon to maintain. As the advantages of exploitation on a larger scale and of more rapidly exhausting the mine became realized, the crushing capacity was increased, and it became necessary to haul larger tonnages of rock and to send larger quantities of materials and larger numbers of men underground. Frequently the shafts remained as they were, with the result that it became extremely difficult to do all that was required. He proceeds: "As tonnage is the primary requirement, everything else has to take second place. Men have to wait underground after shift because the winding engines are busy hoisting rock; drill sharpening has to be done underground because too much time was occupied in taking drills up and down the shaft, and whenever there is a slight breakdown an appeal is made to the Government Mining Engineer to permit rock hoisting on Sunday so as to avoid the hanging up of stamps for want of ore. It may be said that the Department should insist on the provision of larger or more shafts, but it is difficult to justify what would be considered high-handed action, involving the expenditure of very large sums of money, as long as the provisions of the Act and the regulations were not being actually contravened."

* * * *

Rand Hammer Drills for Footwall Work.

The following report of work done on the Witwatersrand G.M. Co., Ltd., shows what can be done with small hand machines when there is a scarcity of native labour. Six Ingersoll B.C.-23 hand rotation jackhammers ran on the Witwatersrand G.M. Co., Ltd., for five months from July to December. 1912. continuously, taking up footwall in hard bastard rock. The method of handling the drills was to allow one drill, weight 54 lbs. per native, on contract at 1d. per foot drilled, with one jumper carrier and a white boss on each three machines. The average footage obtained per drill per eight hours' shift was 28·7 feet, the average depth of hole drilled being four feet, the most suitable to the mine's working condition. These six drills have been responsible for 150 tons of footwall broken per day during the period. This includes block holing or re-drilling broken rock, which was too big for handling. The mine authorities express themselves completely satisfied with the work done, which is peculiarly significant in view of the present shortage of native labour.

* * * *

Frank Smiths.

The fall in Frank Smiths has been the feature of the week on the share market. The following official statement from the local secretaries reaches us as we go to press.—" We are directed to advise you that the following cable has been received from the head office of this company in London: 'Publishing to-day the following; please do likewise: Managing director advises plant still causing trouble; recommends suspending washing operations for a fortnight in order to effect further necessary alterations.' "

* * * *

The Peech Tree Syndicate.

Amongst the various propositions in the Lydenburg-Pilgrims Rest mining area which are now in the developing stage special mention may be made of the Peech Tree Syndicate, which owns claims adjoining the Transvaal Gold Mining Estates Company. A shaft is being sunk which is expected to cut the reef at a depth of about 500 ft., and should reef disclosures prove satisfactory development will be prosecuted on a large scale. Having regard to the value of the ground adjacent to this property the prospects of the syndicate are undoubtedly encouraging.

* * * *

Tanganyika Concessions.

The officials of the Tanganyika Concessions are without information, but we understand (says the *Financial News*) that the first month's run with the two furnaces at Lubumbashi produced 900 tons of copper at a profit of £25 per ton. Working at full capacity the combined smelters were expected to produce between 1,000 and 1,200 tons of copper per month at a cost per ton of copper delivered in Europe of £37, so that the reported results approximate fairly closely to estimate, and doubtless when the plant is properly tuned up there will be an improvement. A monthly output of 1,000 tons at £25 would mean a yearly profit of £300,000, subject to depreciation and other charges. Of course, the figures mentioned relate to the operations of the Union Minière du Haut-Katanga, in which the Tanganyika Concessions holds a 39·2 per cent. interest.

* * * *

Natives and Bioscopes.

It need scarcely be remarked that the comfort and contentment of the natives employed on Witwatersrand mines is a thing very much to be desired, as also is any scheme which will induce " boys " in the native territories to come to the Rand. In these connections we believe the bioscope is capable of doing a great deal. It has been stated to us by a gentleman who has thorough knowledge of the natives in the teeming territories of the Cape Colony that a properly organised series of cinematograph entertainments which would depict native life and work on the Rand, the compounds, feeding arrangements, etc., would, if exhibited in the native territories, have a very noteworthy and beneficial influence. We believe, too, that interesting and instructive pictures of a proper type exhibited along the Main Reef would have a good effect in making coloured workers more contented and happy by providing a little reasonable enjoyment at a small charge after the day's work. In this connection we are glad to see that a committee has advised the Germiston Town Council to grant a municipal licence for a native bioscope hall on the Simmer and Jack mine to Major May.

> The Committee decided to recommend the Council to issue the licence for three months, subject to the conditions of the cinematograph by-laws, and especially as regards the prohibition of smoking and of the presence of any white woman in or about the premises. It was also stated that a strict supervision would be kept over the films. The terms of the Government permit which has been granted include the following conditions: (c) If the Government should have any reason to complain of the character of the entertainment or the class of films being shown to native employees under this permit, the Government may at any time cancel the permit; (d) the Government may at any time investigate the class of entertainment which is being carried on or the conditions under which employees are admitted. . . . . . This permit may be withdrawn at any time for any reason without any compensation on giving one month's notice to do so.

A further matter which is calculated to improve recruiting results is the visiting of mines by native chiefs. It is gratifying to learn that quite a number of coloured satraps have recently paid visits to Main Reef properties and compounds, and we feel sure that the treatment they there saw meted out to their people will have nothing but a beneficial influence for the industry.

* * * *

Leading Industrial Statistics.

The outstanding figures contained in the annual report of the Government Mining Engineer reflect the progress of South African mining in the year. The following leading figures may be put on record:—The total value of the mineral output for the Union in 1912 was £52,711,761, as compared with £47,679,294 in 1911. The total numbers of persons engaged in mines and kindred concerns in the two years were, respectively: 1911, Whites, 38,561; Asiatics, 4,897; natives and other coloured persons, 274,482. 1912: Whites, 36,951; Asiatics, 4,944; natives and other coloured persons, 291,724. The total direct revenue collected in respect of the industry in 1912 was: Transvaal, £1,648,664, as against £1,602,275 in 1911; Orange Free State, £19,865, as against £27,742; Cape, £437,847, as against £696,923; and Natal, £6,080, as against £6,112; the total being £2,113,456, as against £2,333,052 in 1911. The cost of the Mines Department for the year, exclusive of the geological survey, and labour branches, was £126,532. In addition £86,406 was charged against the Departmental Vote in respect of miners' phthisis contributions and other charges. In the Transvaal Province the mineral output for the year was valued at £43,284,673, as against £38,892,509 in the previous twelve months. The total direct revenue in respect of the industry amounted to £1,648,664, as against £1,602,275. The mining rights held in the Province numbered 142,000, as against 164,325 in 1911. The mineral output of the Cape Province was valued at £6,847,586, as against £6,152,554. The revenue collected totalled £438,847, as against £696,923 in 1911. The Free State output was valued at £1,702,687 as against £1,829,159, the revenue being £19,865 as against £27,742. The Natal output was valued at £876,815 as against £865,072, with revenue £4,390 as against £3,660. In respect of the working costs of the Witwatersrand gold mining industry, the report states that the average working costs per ton as compared with 1911 increased by 8d. per ton and the grade increased from 27s. 10d. to 28s. 10d., the working profit being higher by about 3d. per ton milled. The total tonnage milled rose from 23,991,284 to 25,657,235 tons, and the aggregate profit was some £1,262,000 more than for 1911.

* * * *

New Natal Flotation.

The announcement was made some time ago of an important discovery of coal near Vryheid. The seams were put at 5 feet 6 inches and 4 feet thick.. It was reported that the coal would not be mined for fuel purposes, but would be used for the production of sulphate of ammonia and other products. The prospectus of the company which has been formed to undertake this project makes its appearance this week under the title of Natal Ammonium, Ltd. The capital is £325,000, divided into £225,000 in participating non-cumulative preference shares and £100,000 in ordinary shares of £1 each, the latter being entitled to half the surplus profits after 7 per cent. has been paid upon the preference shares. £212,000 of the preference shares are offered for subscription at par, and the vendors have agreed to pay interest at the rate of 7 per cent. for the first two years, covering the period of the construction of the necessary works, this sum to be subsequently refunded out of surplus profits. Reports upon the property state that the two seams outcrop on the hillside and can be traced round it for a distance of ten miles, and, owing to the fact that the coal can be worked on the open face, without shaft sinking or winding, it is estimated that it can be delivered at the recovery works at a cost of 1s. 8d. to 1s. 9d. per ton. It is proposed to erect a Mond by-product recovery plant close to the outcrop, sufficient to deal with 150,000 tons of coal per annum, and to build a light railway nine miles long to connect the works with the Vryheid-Hlobane railway, giving access to Durban. On the basis of the average prices of sulphate of ammonia during the last three years, it is estimated that the net profits should amount to from £55,000 to £74,000 per annum, without including profits from gas, tar, oils, and other by-products. The purchase price has been fixed at £113,000, payable as to £13,000 in preference shares and £100,000 in ordinary shares, and out of this the vendors agree to pay all the preliminary expenses, except the cost of registration and the cash underwriting commission, estimated together at £9,500. The cost of the necessary works, etc., is put at £202,500, which will leave about £15,000 available for working capital. The board is a strong one, including the Earl of Selborne, Mr. Emile S. Mond, Mr. Robert Mond, Mr. Robert Armitage and Mr. H. W. Morrison, and the vendors take the whole of the purchase price in shares. It is noteworthy that the vendor syndicate have paid, or are under obligation to pay, to the sub-vendors, namely, to Mr. Richard Anthony Rouillard, of Vryheid, Natal, the sum of £6,000 in cash and 8,000 fully-paid preference shares (or at his option 8,000 ordinary shares), and to the Electro-Chemical Company of South Africa, Ltd., of Johannesburg, the sum of £4,000 in cash and 18,000 fully-paid ordinary shares. Messrs. Harper Bros. & Co., the consulting engineers, are the principal shareholders in the Electro-Chemical Company of South Africa, Ltd., and as such, and as having guaranteed (through Mr. W. A. Harper) the performance of its contracts by such company, are interested in the formation of the company. Some further particulars of the prospects of the venture will appear at an early date.

* * * *

Transvaal Gold Mining Estates.

The report of the Transvaal Gold Mining Estates, Ltd., for the year ended 31st March, 1913, to be submitted at the meeting on the 19th September, at Johannesburg, states that the net profit on working for the year amounted to £277,415, which, with the sum of £80,626, being the balance unappropriated at the close of the previous financial year—namely, £80,666—less an amount of £40 paid on account of old dividends claimed, together with the sum of £192, representing the difference between nominal value of debentures purchases and cost thereof, and £100, unclaimed dividends written back, makes a total of £358,333, which has been dealt with as follows:—Government tax on profits, £25,170; dividends (Nos. 13 and 14), £226,584; expenditure on property and mine equipment, £5,471; nominal value of debentures purchased, £18,436; balance unappropriated, carried to balance sheet, and represented by cash and cash assets, less liabilities, £82,671. A credit of £4,258 is shown under the head of mine development suspense, and represents the difference between the sum charged monthly to working costs and the amount actually expended on development work at the Central mines. The amount of £26,638 remaining from the proceeds of the issue of £124,000 five per cent. first mortgage debentures at close of last financial year, and a further sum of £23,907 provided out of profits, has been absorbed by the expenditure on the extension of cyanide plant, crusher station at the Central works, electrification, etc., of Duke's Hill South and Jubilee tramlines, Peach Tree compressor plant, Elandsdrift power station, the purchase of debentures and of the remaining half portion of farm London No. 1,220, etc. In accordance with the debenture trust deed, purchases to the extent of £18,436 were executed, at an average price of £98 11s. 2d. The amount to be redeemed on 1st April, 1913—namely, £15,000—being exceeded by the above purchases, no drawing was necessary at that date, and the surplus of £3,436 will go towards the amount of £15,000 required to be redeemed on 1st April, 1914. The debentures acquired have been duly cancelled. Dividends Nos. 13 and 14 of 17½ per cent. and 20 per cent. respectively, amounting to £226,584, have been declared payable to shareholders during the year. The total expenditure on capital account during the year under review amounted to £32,110.

TOPICS OF THE WEEK.

A FOOTNOTE TO THE GOVERNMENT MINING ENGINEER'S REPORT.

"No agitator has ever framed a more scathing indictment of the mining industry than that contained in the last annual report of the Government Mining Engineer," is the opinion, privately expressed, of a leading South African statesman, whose name, unfortunately, cannot be given. This, coming on the top of the extraordinary views of some of the London papers cabled out during the week provides food for thought. It is true that the public man in question is not very closely in touch with the Rand, and that until the recent unrest had drawn attention to conditions here, the industrial hygienic developments of the last few years had doubtless escaped his notice. His opinion, for that very reason, however, commands consideration, since it may be regarded as typical of that of the average newspaper reader, unacquainted with all the facts. Again, we have Reuter cabling out a jumble of ill-informed opinion, interspersed with belated—not to say infantile—advice from no less an authority than the *Pall Mall Gazette*. It would be folly to take too seriously a mere cabled version of hasty newspaper comment on what was itself a cabled version of the views contained in the Government Mining Engineer's report. Doubtless the "mine owners" whom the *Pall Mall* admonishes will, in their own way, take steps to remove whatever misunderstanding a sifting of these various reports may reveal. In the meantime, however, a few remarks may be offered in regard to the source of all the trouble—the Government Mining Engineer's report. Criticism of any official report is hampered by the knowledge that its authors, under the rules of the Civil Service, cannot reply. The responsible Minister, however—in this case Mr. Malan—suffers from no such disability, and it may be expected that he will not lightly ignore any unjust aspersions on his department. And it is only fair to admit at once that the report issued last week is the biggest and most comprehensive compilation of its kind penned in South Africa, and that it makes a serious attempt to mirror the many-sided mining activities of the whole Union. Those sections dealing with Rand health conditions, however, though they contain much that is true and much that is new, suffer from the defect that what is true is not new, and what is new is not true. Thus, the elaborate writing up of the "panic" created by the phthisis evil is merely a singularly belated rehash of the opinions expressed so fully some eighteen months ago by engineers and mine managers in the discussions on the subject before the Rand technical societies. Thus, as far back as March, 1912, Mr. R. A. Barry, manager of the Nourse Mines, read a paper before the Chemical, Metallurgical and Mining Society, in which he showed that phthisis had killed or frightened off the best miners, that the incompetence of those that remained had helped to send up the accident rate, to make far too frequent changes among the men, and that the high wages which went to keep up working costs were directly due to the combined effect of phthisis, accidents and the limited supply of experienced miners. In commenting on Mr. Barry's paper at the time, we described it as "tracing the course of the vicious circle in which these evils act and react upon one another." Other critics, drawn from the ranks of the industry, notably Mr. J. Chilton, called attention to the same phenomena about the same time. Beyond the usual official emphasis and a studied, dispassionate air of disinterestedness, the report of the Government Mining Engineer adds nothing to those eighteen months' old facts and opinions. Where it does surprise, however, is in its failure to render full justice to the efforts of Rand managers and engineers to reform the many admitted evils of the industry. It is true, as pointed out in these columns last week, that the Secretary for Mines pays some tribute to recent improvements, and there are vague references to the same tendency in the Government Mining Engineer's report itself. But these are completely overshadowed by the obvious desire of the Government Mining Engineer to assume the all-too-easy mantle of the critic. Well over a year ago Mr. J. Chilton, quite the most fearless and outspoken critic that the industry has provoked since the war, was forced, in concluding his attack on Rand methods as they then were, to admit the following in favour of those who were engaged in reforming the industry from within:—"Miners' phthisis, originally an obscure disease, has been brought forth into the light, its causation and prevention has received attention from the highest scientific authorities, and measures have been adopted that bid fair to make this disease as rare as the Black Death. In our mines miles of water pipes have been installed and millions of gallons of water are being sent down to allay the deadly dust, and sprays, respirators, atomisers, hoses, and sprinklers are being used to accomplish the same desirable end. In the matter of miners' phthisis we have undoubtedly progressed, nor is our advancement limited to this subject only. Mine ventilation has received attention, and the huge fans that have been installed in many of our mines will have a considerable effect upon the accident rate, for no person can give his attention to safety measures if his brain is dazed and clouded by breathing in a vitiated atmosphere. Pure air may primarily be an efficiency measure, but it reacts upon safety conditions and tends to produce that mental alertness that is so desirable in underground workers. Sanitation and first-aid appliances have not escaped consideration, and in these a great improvement is noticeable. In mining methods we find that back stoping and raising are being frowned upon in high technical circles, because of their dust-producing tendency, and all through there is evidence of the wish to ameliorate mining conditions. All these improvements have been made in the last five years, and though we have not yet reached the Golden Age of mining, we will keep on pointing out where improvements could be made, though the results may not be seen till after many days." All this, it must be noted, was written over twelve months ago; and it is obviously unfair to publish a Government report to-day which ignores these reforming tendencies, while laying the colour with no unsparing hand on the dark side of the picture. Doubtless it will be claimed in defence that the long period that is bound to elapse between the writing of a report of this sort and its issue in blue-book form renders its contents necessarily open to just such criticism as we have offered. But surely the time to think of that is when the report is written, not when it is published. It is no use mincing words. The issue, at this time of industrial upheaval, of a report of this grave nature, compounded of violent, *ex parte* opinions condemnatory of the methods of a whole industry, which is given no opportunity to refute them before publication, seems a serious error of judgment on the part of the Minister responsible. If it was necessary to delay eight months before publishing the report, why this extraordinary haste to get it out now? A few more days' delay would have sufficed to bring it up to date or qualify its more sweeping allegations. Or, in greater fairness still, its appearance might have been delayed until such time as even the most thoughtless could not fail to recognise its true value as an interesting historical document reflecting the Government Mining Engineer's views at the end of 1912. Its issue in its present form to-day is unjust and unpolitic—a blunder likely to aggravate rather than allay the existing unrest.

LABOUR'S PREPONDERATING RETURN FROM LOW GRADE MINES.

It is a truism that the low grade mines of the Rand—which form the majority of the producers—are run mainly for the benefit of those to whom they give employment, directly or indirectly. Taking, for example, the case of the Simmer Deep, it is notorious that the company up to the present has paid no dividends to its shareholders, and has only existed for the purpose of paying wages and buying the necessary stores to run the mine. Thus, a mine like the Simmer Deep is just as valuable to the country as the most prosperous mine of the same size that exists on the fields. It also pays just as high wages for the same work. A new country like South Africa necessarily has to borrow most of its capital for the development of an industry. Consequently, broadly speaking, the dividends earned in return for that capital go out of the country, and the main benefit to the country is the money spent in wages and stores which remain in it. The following are the exact figures of the Simmer Deep:—The average recovery value in 1912 was 17s. 6d. per ton and the working costs 16s. 4d. The total gold produced realized £521,957, and the working profit was £35,546. The working cost amounted to £486,411, which can be allocated as follows:—White wages, £146,896; native wages, £85,754; stores, etc., £253,761. The £35,000 of working profit was entirely absorbed in interest on debentures, leaving nothing to the shareholders. As Professor J. G. Lawn pointed out before the recent Select Committee on European Employment and Labour Conditions, a mine like this is of the nature of an unmerited asset to the country. It is of just as much benefit to the country as if it were a rich mine, and yet the shareholders receive nothing. Clearly the country cannot expect plums of this kind very often, as it is evident that if the shareholders had anticipated that it was of so little value they would never have provided the capital necessary to develop and equip it. Further, if it were once closed down it is doubtful whether it would again be worked for many years to come, if ever. Again, the closing down of the Lancaster West mine in February last has not only meant heavy loss and disappointment to the shareholders but it means the annual loss to the country of the greater portion of the quarter of a million working costs previously expended annually by that mine. In this connection it is noteworthy that similar conditions are not unknown on other mining fields. For instance, it appears that the Labour Unions in Western Australia have recently demanded that the *minimum* wage for surface labourers be raised from 10s. to 11s. 8d., and that of underground labourers from 11s. to 12s. per shift. At the present time, the average earnings on the Witwatersrand per white employee (excluding staff) are approximately £315 per annum, which is at least one-third higher than the wage paid to similar classes of men in Western Australia. Replying to a question before the recent Committee, to the effect that if Western Australia can afford to pay the above wages to an all white labour force, why should not the gold mines of South Africa do the same, Professor Lawn said that even at the Western Australian rate of wages (12s. 6d. per shift) 35 out of 52 mines of the Rand could not be worked at a profit. Further, the wages for the same occupations on the Rand are at least one-third higher than those paid on the mines of Western Australia. If the wages paid on Western Australia gold mines be increased to correspond with those on the Rand, that increase of one-third would have the effect of closing down many of the Western Australia mines. We may conclude with the following pertinent extract from a speech by the President of the Western Australia Chamber of Mines:—"At present we are witnessing the anomaly of the highest paid class of workers on the field, probably in the world for their particular class of work, striking for higher pay and better conditions and ignoring the means provided by Parliament for the settlement of such disputes. It is safe to say that if a proportionate rise in wages based on the demand of the highest paid workers, was obtained by all the men working on the mines, it would immediately render unprofitable the operations of a third of the mines connected with the Chamber, and throw some thousands of men out of work, who would be forced to seek employment in other industries which pay a lower rate of wages. The attitude of some of the workers is such that if they tried to devise means to wipe out the industry of mining, they could could not adopt a more effective plan. It is difficult to understand how many men can be induced to follow a procedure, which, if successful would eventually result in giving higher wages for a short time to those working in the richer mines and throw the remainder out of mining employment."

THE LOT OF THE RAND MINE WORKER.

A Special Enquiry into the Conditions of Life and Work along the Reef.

II.—HOW THE MEN OF THE ROBINSON DEEP FARE

In our last issue we dealt at some length with the rates of pay prevailing at four typical mines under Corner House control. This week we follow the subject of the miner's lot further. We now propose to describe the impressions gained by a representative of this paper who visited the Robinson Deep mine during the week with a view to enquiring into the conditions of living at this Central Rand deep level property, which is under the control of the Consolidated Gold Fields of South Africa. The Robinson Deep was selected for an inspection for no particular reason, neither were the officials of the mine acquainted beforehand with the object of our representative's visit.

The Co-operative Committees.

On this, as on other mines of the Gold Fields group, all arrangements with regard to boarding house, recreation hall, etc., are run on purely co-operative and mutual lines. There are three separate committees elected by the men to organise and superintend the co-operative social schemes of the mine. These committees are representative of the various working departments of the mine both above and below ground. Members of the committees, we understand, hold office for one year from date of election, and election is decided at a general meeting of the employees. There is one committee to manage the co-operative mess. The members appoint a mess caterer and see that a good standard of fare is maintained together with cleanliness, whilst at the same time economy is strictly observed. Members of another committee are entrusted with the recreative organisations of the mine, whilst a third committee manages the affairs of the Robinson Deep Benefit Society. It will be seen that the control of these institutions on the property is entirely in the hands of the employees, whilst each institution is run on purely mutual lines. From what our representative observed on Wednesday last everything possible in connection with the welfare of the men and their families was being done. There appeared to be no cause for complaint in regard to the boarding house, living quarters, recreation and library clubs or benefit society. Indeed, there seemed to be a sort of happy family air abroad on the property. A little examination of living conditions sufficed to show that an atmosphere of contentment was only to be expected.

The Workers' Table.

The boarding house was first visited. Here in a large and airy building are three separate mess rooms—one for heads of departments, another for staff subordinates, and a third (a much larger room) for the men generally. It was just before the twelve o'clock luncheon hour, and the tables were all well and truly laid. There was none of that barrack room atmosphere of cold comfort which one involuntarily (and generally wrongly) associates with mine boarding houses about the place. Each room was bright and lofty with comfortable seating accommodation and an excellent table. The kitchen appeared to be spotlessly clean, and white waiters were to be observed bustling around with dishes of fruit, knives and forks, or other necessary implements for the war about to be waged on the viands. Our representative took from one of the tables the following menu card:—

LUNCHEON.

Soup:

Giblet.

Fish:

Boiled Stock Fish and Egg Sauce.

Entrées:

Grilled Rump Steak and Chips.
Macaroni Cheese.

Cold Joints:

Roast Sirloin of Beef
Roast Leg of Mutton.
Roast Lamb and Mint Sauce
Boiled Pressed and Corned Beef.
Pottedhead Polony

Vegetables.

Mashed and Boiled Potatoes.

Sweets:

Blanc Mange and Fruit Salad.

Fruit, Cheese, Salad, Tea, Coffee

The dinner provided for the workers that evening was as follows:—

DINNER.

Soup:

Printinaire.

Fish:

Crumbed Silver Fish.

Entrées:

Stuffed Roast Chicken.
Scotched Eggs and Brown Sauce.

Hot Joints:

Roast Sirloin of Beef and Yorkshire Pudding.
Roast Haunch of Mutton.
Roast Lamb and Mint Sauce.

Vegetables:

Baked, Boiled and Mashed Potatoes.
Cabbage, Boiled Onions.

Sweets:

Apple Charlotte.

Fruit, Cheese, Tea, Coffee

Breakfast at the Robinson Deep mess consists of porridge, eggs cooked in a number of ways, and on different mornings liver, kidneys, sausages, etc., and of course tea and coffee. Miners in other parts of the world may learn of these things with envy. What a contrast to the humble "pasty" or "figgy-hoggen" meal of the workers in the Cornish tin mines! As to the quality of the fare, we may without in any way disparaging the catering department of the South African Railways state that a meal at the Robinson Deep mess has been most favourably compared with the more expensive déjeuner provided at the Park Station Restaurant, which is famed throughout the country. The bill of fare provided for heads of departments, staff subordinates, and men is exactly the same at each meal. The charges are: for the staff £6 10s. per month per head, and for the men £6 per month. Learners and men earning under ten shillings per day are provided with exactly the same fare for £4 10s. per month.

The Dwelling Houses.

A move was made to the staff, married men's and single men's quarters. These are in close proximity to the boarding house and surrounding a capacious tennis court, which, by the way, can be played on by any employee for the small sum of 2s. 6d. per month. The dwelling houses are arranged in neat little streets planted with gum trees, and very comfortable and homely indeed the majority of these quarters appear. The Robinson Deep is one of the older mines of the Rand and some of the houses scarcely come up to the standard of mine dwellings set by certain of the newer mines on the Further East Rand. At the same time little fault can be found with either the cottages of the married workers or the less pretentious rooms of the single men, and as newer structures are erected the standard of housing steadily improves. A dwelling house or a single room reflects, of course, the character of the inhabitants. A man may make the interior of his quarters cosy, bright and attractive, or ugly, bare and forbidding as the case may be. Some of the rooms our representative inspected at the Robinson Deep were furnished and decorated in quite charming taste. The rent-embarrassed town bachelor who has to pay £5 or £6 per month for a room in any decent building or locality may well envy the worker on the mine who for only ten shillings a month can rent well-built quarters with gum trees at his door. The cottages of the married men, too, consisting as they do of four big brick-lined rooms, with kitchen, pantry and bathroom at £4 5s. or £4 10s. per month (including electric light, water, and four bags of coal) represent most excellent value, and at the wish of the dwellers these quarters can at very modest cost be made miniature mansions of comfort, cleanliness and homeliness.

The Recreation Hall.

The man on the mine has in the many excellently organised and furnished recreation halls along the reef a cheap and highly enjoyable means of spending his after work hours. The large building designed by the Robinson Deep Company for leisure affords a typical example of one of these comfortable clubs. Entering the hall from the road running past the mine offices, one sees before one tables littered with newspapers and periodicals, and at the back a stage used for amateur theatricals, concerts and other social functions. When dances are arranged the reading tables are cleared and an excellent floor is available. Adjacent is a smaller reading room, and in another portion of the building are two good billiard tables which can be played on at the very nominal charge of 6d. per hundred. There is an excellent library which contains a large selection of works of fiction, biography, sport, travel, poetry, history, etc., which may be borrowed by members. The establishment is completed by a barber's shop, where, in addition to the conventional shave or hair cut, cigarettes, tobacco and chocolates may be purchased. Membership of this really excellent club, to which all employees are eligible, costs only 2s. 6d. per month, and here again the town dweller casts envious eyes around and wonders where he can for a nominal penny a day find such accommodation and recreative enjoyment as is provided for the toilers of this deep level. Outside the club house is a miniature rifle range, membership of which costs 1s. per month.

The Benefit Society.

In sickness or accident the mine Benefit Society comes to the aid and succour of the ailing or the injured. All employees are insured by the company against accident and during disablement are on half-pay. In both accident and illness medical attendance and medicine is provided free by the Benefit Society, membership of which costs but 5s. per month for married and 3s. 6d. per month for single men. One of the "demands" of the Federation of Trades to the Government and the Chamber of Mines was that mine benefit funds should be placed under Government supervision and control. The mining Houses can have no possible objection to this, but how will it benefit the men themselves? Take the particular case of the Robinson Deep Society. The members of the committee governing that society are elected by the men themselves. Subscriptions are reduced as funds on hand are augmented, and surely the men on the mine and their elected representatives can redress such grievances as may occur and see that aid and succour are given where most urgently needed far more readily and expeditiously than the Government, a body politic always harassed by a million and one cares of State and hedged in and around by red tape. One cannot but think this is but another "demand" of the agitating leaders which does not reflect the great bulk of opinion.

The Monthly Cheque.

Having briefly covered the above ground details of life of the Robinson Deep mine worker, let us attempt to sum up his financial position at the end of the month. We will assume the subject of our enquiry is a single man and earning, say, £22 10s. per month, by no means a rare wage on the property. We are not concerned with his outside extravagances and whims. He may be a whippet racing enthusiast or have a penchant for the costlier sport of the Turffontein racecourse. Perhaps he dabbles in 30-day options or affects costly clothes. These are things quite outside the scope of this article, and we will attempt to sum up the matter in this fashion after assuming that he takes advantage of all the privileges offered by the mine. On the credit side of his monthly ledger book we have "By Salary," £22 10s. The debits are:—

Mess Account	£6	0	0
Room, Light and Water	0	10	0
Tennis Club	0	2	6
Recreation Hall	0	2	6
Air Rifle Club	0	1	0
Benefit Society	0	3	6
	£6	19	6

This leaves him with a balance of £15 10s. 6d. after pay day. Of course there must inevitably be other considerations and expenses quite apart from extravagances. But at the same time having regard to accommodation, food, benefit society and recreation club privileges the wage earner we have here taken as a subject for enquiry has very little to grumble at. One thing is certain: he can obtain the necessaries of life through his mine co-operative societies at much less cost than the office worker in Johannesburg itself. And as to comparisons with other mining fields, we contend that there can be no comparisons.

The New Pniel Company.

Speaking at the special meeting of the Pniel Estate Co., last week, the Chairman said, *inter alia*:—

The purchase price received by this company for its assets is, under the circumstances, a very fair one, notwithstanding the fact that its chief assets consist of the mineral lease over the Pniel Estate, some ninety square miles in extent, with a frontage to the Vaal River of about twenty miles, and on which are known to exist heavy alluvial diamondiferous deposits. After the liabilities of this company have been discharged, amounting to some £17,000, and which together with the 60,000 shares brings the total purchase price of this company's assets to about £77,000, Pniels, Limited, will have over £20,000 cash working capital wherewith to develop its mineral resources. Seeing that its chief revenue is derived from the finds made by the diggers, this sum should be adequate to put the company into such a position as to further the interests of the diggers, and assist them in every possible way with the object of materially adding to its revenue from the alluvial diggings. It is the intention, I understand, of Pniels, Limited, to throw open the large alluvial diamondiferous deposits on the Pniel Estate, and to encourage diggers by every possible means to take up their residence on the Estate and turn these alluvial deposits to account for the mutual benefit of the company and themselves. It is a well-known fact that the most valuable alluvial deposits of the Vaal River Estates are in close proximity to the western boundary of the Pniel Estate, and there is every season to expect that equally as rich deposits will be found on the Pniel Estate. The shareholders of this company, by becoming shareholders in Pniels, Limited, have acquired a 60 per cent. interest in its capital, and have had their interest transferred from a moribund to a live company, free of the burden of liabilities and with sufficient cash resources to develop the mineral wealth of the Pniel Estate.

Oceana Development.

The Secretary of the Oceana Development Company, Ltd., has issued a circular to the shareholders stating that: "In accordance with the decision of your directors to develop their properties with the idea of disposing of the surface rights as small farms, they have now accepted a cash offer of £3 per morgen (which equals 2·1165 acres) for a portion, consisting of 972 morgen, of the farm Koppieskraal, and negotiations are proceeding for the sale of the remainder of this farm, consisting of 9,190 acres. The adjoining farm Eendracht, consisting of 4,079 acres, is under offer at £4 per morgen. As the rental received by the Oceana Development Company for these two farms has up to now been only £150 per annum, your company will benefit to a great extent by these sales. Your company still holds their remaining farms, consisting of 53,239 acres, and will in all sales reserve to itself the mineral rights. I am also instructed to inform you that negotiations of great importance which have been proceeding for the last six months are now rapidly approaching completion, and your directors, wishing to be in a position to place full details before the shareholders at the annual general meeting, have decided to postpone the date for holding same until September next."

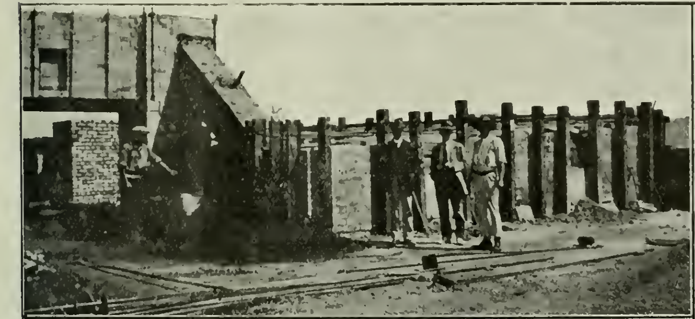
SMELTING OPERATIONS AT MESSINA.

Successful Results Obtained—The Furnaces Described.

In a recent issue reference was made to the starting of smelting operations at the Messina Copper Mine in the Northern Transvaal, and we are now in a position to give a brief description of the smelting operations and the results obtained, since starting up the first reverberatory smelting furnace at the beginning of the month.

Method of Treatment.

Careful laboratory experiments have been carried out for some time on the Messina ores, by metallurgical experts both in this country and in England, for the purpose of obtaining a definite knowledge of the most economical method of treatment as well as the probable smelting costs. The treatment by concentration methods of the high grade copper ores has presented no difficulties, and for many years regular shipments of concentrate have been made to Swansea, where this product has commanded a ready sale at the highest ruling market prices, owing to the purity and good quality of the metallic contents. In connection with the treatment of the ores by mechanical methods, a considerable quantity of product has been produced each month, known as "jig middlings" containing from 10 per cent. to 15 per cent. copper, which has been accumulated for re-treatment, either by re-grinding and further concentration, or by smelting. In connection with the new concentrating plant now in course of erection, which will have a capacity to treat 250 tons of ore per day, provision has been made for re-grinding plant to deal with the current middling product. In addition to this, treatment by smelting has been decided upon, to turn to profitable account the large stock of accumulated middling and also to handle the lower grade carbonate and sulphide ores which are not so susceptible of mechanical concentration as the more massive sulphides.



General View of Smelting Furnace.

Drawing off Slag.

Tapping Copper Matte.

The Smelting Furnaces.

The character of the ores to be treated, the nature of available fuel and fluxes, have been carefully considered in preparing the design and size of the most suitable furnace. In this respect, fine ores, concentrate and middling had to be treated, and it was considered advisable to erect furnaces of reverberatory type, such as generally used in Wales for smelting copper ores. Two furnaces have been erected, each having a hearth 23 ft. long by 11½ ft. wide, with both furnace flues leading to a 70 ft. high chimney, lined with fire-brick. The fire boxes have been arranged for burning coal fuel. The slag is drawn off into sand baths and the matte containing the copper, is tapped into iron moulds. The ironwork for the construction of these furnaces has been supplied by Messrs. Fraser & Chalmers, Ltd., and the fire-bricks which comprise the bulk of the furnace material, have been obtained from local makers, and found quite suitable for this class of work. Special silica fire bricks have been imported from Wales for a start, although it is expected that a suitable quality of brick will yet be made in this country. The capacity of each furnace is about 20 tons of ore per 24 hours, for which the fuel consumption will be from 7 to 8 tons of small coal. Fuel from the Messina Company's coal mine, about 20 miles south on the new railway line, has been found quite suitable and the necessary limestone which is mixed with the ore for fluxing purposes, is found in the neighbourhood of the mine.

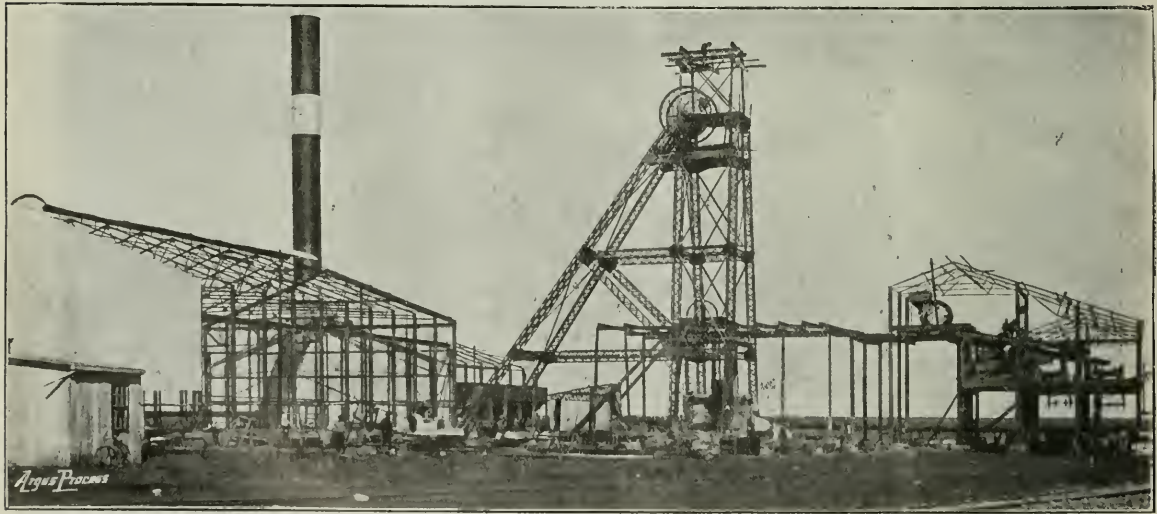
Smelting Results.

The first furnace was started up with a charge of middling, mixed with some roasted copper pyrites, containing about 15 per cent. copper and about 5 per cent. lime added. This charge was successfully reduced, and produced a matte containing 65 per cent. copper, with 1½ per cent copper in the slag. Since the initial charge was put through, the composition of the charges has been varied as regards copper content, lime, method of firing, etc., with highly satisfactory results, indicating that the Messina ores can be reduced by this method of smelting on a practical scale to give an average grade of 50 per cent. copper matte, and on the lines carried out by laboratory experiments. It is expected that the two furnaces will produce about 150 tons of copper matte per month, which at present will be shipped with the mill concentrates. Additions to the smelting plant are already contemplated, and a roasting furnace and two additional reverberatory furnaces will be erected in the near future. The treatment of the matte is also under consideration, and with the addition of a refining furnace, blister copper will ultimately be produced and shipped as ingots containing 96 per cent. copper. The smelting operations at Messina are in charge of Mr. T. Nicholls, who was for many years at the works of the Cape Copper Co., in South Wales. The accompanying photographs are of interest as showing the general construction of the furnaces and their actual operation.

THE BRIGHT PROSPECTS OF UITKYK COLLIERIES.

Details of an Important Coal Property of Great Potentialities.

The Uitkyk Collieries, Ltd.. are issuing 75,000 8 per cent. cumulative convertible preference shares of £1 each, offered for public-subscription at par, payable as to 2s. 6d. per share on application and 17s. 6d. per share on allotment. Of the new issue, the emission of which is made in London, 20,000 shares have been received for subscription in South Africa. The share capital of the company will then consist of 100,000 ordinary £1 shares (of which 39,410 shares have been issued and are fully paid), and 75,000 8 per cent. cumulative convertible preference shares. These preference shares, both as regards the cumulative preference dividend of 8 per cent. and the return of capital, will rank in priority to the ordinary shares, and have the right, when fully paid, of conversion into ordinary shares, on payment of a premium of 10s. per share, at any time prior to the 1st of January, 1917. Ordinary shares are entitled to the whole of the surplus distributable profits remaining after the payment of the 8 per cent. cumulative preferential dividend on the preference shares The original company was formed in 1909 under the name of the Vaalbank Coal Company, and it has since been changed to its present name of Uitkyk Collieries, in order to prevent confusion with another colliery and to acquire the freehold of a portion of Vaalbank, in the Middelburg district. The properties then consisted of the freehold of portions of Vaalbank, about 1,700 acres in extent, and leasehold of about 800 acres of the farm Tweefontein, adjoining Vaalbank. Since then additional freehold and leasehold properties have been acquired. These are: Freehold of approximately 11 acres along side station yard at Uitkyk station, on the main line of the South African Railways from Johannesburg to Delagoa Bay (situated approximately in the centre of the portion of the farm Uitkyk acquired). Freehold of the southern half and coal lease over the northern half of the original farm Uitkyk No. 337, Middelburg district, Transvaal, together some 3,700 acres in extent. An option has been obtained to purchase the coal rights over about 4,900 acres of Pattatafontein No. 327, Middelburg district, at a very low figure. The estimated saleable coal contents, the prospectus states, of the above properties, is well over 120,000,000 tons. A new large equipment, capable of handling 1,000 tons per diem, has recently been added to the 600 tons plant already in operation The new plant will be in full operation immediately. The proceeds of the present issue of shares are required for the repayment of a loan of £50,000, which was raised to purchase and complete the equipment, and for the provision of further working capital. Arrangements have been made for the sale of all coal available during the present year, and good contracts have been entered into with consumers for a period of years up to 1918. It is expected that a big export trade will be cultivated through Delagoa Bay, and already a first shipment of 6,000 tons for Bombay has been made. The management of the colliery has been undertaken by Mr. J. G. Howard, who was for so many years the general manager of the Transvaal and Delagoa Bay Colliery at Witbank, and enjoys a reputation as a coal mine manager second to none in the Transvaal. A glance at the names on the directorate will satisfy even the most fastidious, and the present issue is bound to be largely over-subscribed. Further particulars will be found in our advertising columns.



View of Main Headgear, Boiler House, etc., Uitkyk Collieries, Ltd. (when under construction).

RAND MINE ACCIDENTS.

The City Deep Catastrophe—Need for Rescue Appliances—The G.M.E.'s Views.

Prominence has been directed to the subject of accidents in Witwatersrand mines during the past week or two by the publication of the report of the Government Mining Engineer, which devotes considerable space to a consideration of this highly important matter, whilst interest in the subject has been quickened by the explosion of blasting gelatine in the City Deep, resulting in five deaths. It is not our purpose at this juncture to discuss in detail statistics relative to accident and accident death-rates in the mines of the Main Reef series, but rather to single out one or two special points of the Government Mining Engineer's report and to comment on the City Deep catastrophe and the likely results this accident will have in regard to provisions for rescue work in the event of other and similar accidents taking place.

A Mysterious Occurrence.

The cause of the City Deep explosion is veiled in mystery. Mr. Hammond, the shift boss on No. 9 level, in giving evidence at the Government enquiry, said he was convinced that no explosion had taken place at the face, but he could not explain the cause of the accident. Although the real causes of the fatality cannot be accounted for, that does not in any way weaken the case for provision of ways and means for succour of the injured in the presence of noxious fumes. Mr. Hammond related that in attempting to recover the body of Leeson (the white victim of the accident) he was twice driven up the winze he was endeavouring to descend by the noxious fumes. There have been other cases on the Witwatersrand of men attempting rescue work being driven back by the fumes of exploded gelatine or of being "gassed," and the catastrophe of the City Deep seems to demand that all mines shall be equipped with proper apparatus to enable rescue parties to enter ends and winzes, etc., in which the air is foul and dangerous. All the Natal colliery mines are equipped with rescue helmets, but on the Witwatersrand, whilst the mining regulations at present provide for two stretchers and two first-aid boxes—containing bandages, splints, lint, ointment, dressings and tourniquets—a portable oxygen apparatus, and two electric lamps, there is no provision for helmets to enable rescue parties to go into "gassy" places. At present the only provision for combatting the nitrous oxide fumes created by blasting, that is by the burning of dynamite, is the turning on of the air. These fumes are particularly noxious in development work, and the air space in a winze is so small that rescue work, to be effective, must be prompt. The Mines Department, so it is understood, are seeking to remedy this deficiency in the hygienic equipments of the mines, but are awaiting the report of a committee on the subject before introducing compulsory measures. This committee consists of the Natal Inspector of Mines, the manager of the St. George's Colliery, and a representative of the Coal Owners' Association, and these gentlemen are at present endeavouring to decide upon a standard class of apparatus for enabling men to do rescue work amid fumes and noxious gases. It is anticipated that the work of this committee will be completed within a couple of months, and upon its report the most suitable rescue apparatus will be installed in all the mines.

Blasting Certificates.

So much for the City Deep fatality. In regard to accidents generally along the Reef we take the following excerpts from the Government Mining Engineer's report. The other principal causes and aspects of the accident rates of the mines have been dealt with in previous issues of this journal.

Referring to the issue of blasting certificates, the report states that out of a total of 1,927 permanent blasting certificates issued by Transvaal inspectors, 776 were given after examination of candidates by inspectors; 905 in exchange for provisional certificates, or on the recommendation of managers; 246 were duplicates of certificates lost or in exchange for South African Republic or Natal certificates. The blasting certificates of ninety-three miners were suspended for varying periods, four certificates were withdrawn and twenty-six miners were cautioned.

"AIR BLASTS."

The rock burst only appeared prominent on these fields some six years ago, and, like artificial ventilation, was enshrouded in a good deal of mystery. It is generally recognised that these pressure bursts are the result of altered strains and stresses due to large excavations and deep mining and intimately connected with faults, fault planes and other lines of weakness. Extra pillars, unless large enough to prohibit economic mining, would not appear to stop the danger, and at times increase it to a very marked degree. The remedy is to fill and pack stopes, and to keep this filling and packing as near the stope face as possible, to avoid stripping ore along fault planes where air blasts are occurring, and to sheathe drive and stope pillars in areas already under pressure.

MACHINE DRILLS.

A fruitful source of accident from falls of ground is the indiscriminate use by incompetent persons of heavy machines for stoping. Many stopes are "tender" and "uneasy," and only require a jar of one or more heavy drills to bring large portions of the hanging wall down during working hours. Many persons do not appear to realise the bad effect that drills, even working at a distance of hundreds of feet, have on surrounding strata. Here again the "rush" for rock compels the use of a dangerous uneconomical machine, as many a stope that could be worked safely with hand stoping and small blasts, becomes dangerous when stoping with machines and heavy blasting are carried on. The skilled miner, with his better knowledge and training, will only utilise his rock drill for breaking ground along the natural lines of weakness, calculating his holes to break a maximum of ground with a minimum of explosives, but the ordinary ganger of to-day, knowing the power at his disposal, often breaks indiscriminately into the foot or hanging wall, and ruins the supporting power of the enclosing strata.

SHAFT SINKING.

The danger in shaft sinking where from thirty to sixty persons may be crowded together in a shaft bottom has caused this Department to make every effort to minimise the risk of misfires in shaft sinking. In the new regulations a rule has been included, making it compulsory to have special supervision in a sinking shaft with arrangements for blowing over the shaft bottom with air or water under pressure as an aid to detect misfires after blasting In addition to these precautions, a sketch taken after blasting showing the position of all misfires and sockets is also compulsory. These precautions in shaft sinking have been adopted on several of the diamond mines for some years past, but whether their low accident death-rate is due to these special safeguards entirely, or is caused by the absence of rushing methods and more careful mining, cannot as yet be ascertained. Certainly these new shaft sinking regulations have met with a good deal of disfavour among managers along the Rand, partially, in my opinion, on the ground of the expense of the extra supervision, and partially from the suspicion that the Rand record in smart shaft sinking might be lowered by delays caused by these restrictions. A few representative persons appeared to be genuinely afraid of directing air or water under pressure into cavities containing fragments of explosives. To show that sinking accidents can be kept within a reasonable limit, we have 6,300 feet of sinking done at the South Rand and Turf Mines shafts with a death-rate far below the average for the Witwatersrand shaft sinking, all of which was done at a fair speed and reasonable cost. As a prevention of misfires in shaft sinking especially, it has been suggested to employ a better fuse and a different method of charging and priming. This matter is worth attention and is being investigated. For the time being, at any rate, inspectors have inaugurated a special examination and blowing over of all shaft bottoms, including a sketch, and the necessary extra attention that this method involves. This regulation will be given a fair trial and will be rigidly enforced.

MISSFIRE ACCIDENTS.

Accidents from missfires in stopes, rises, winzes and development faces are far too numerous, and, where practicable, the regulation governing the extra precaution to be taken in sinking shafts has been extended to these workings. Numerous missfire accidents are still caused by the carelessness of the ganger in not properly examining his bench before rigging his machine and laying out new holes, and the Department is determined to adopt the most severe measures to prevent and punish carelessness of this description. At times the machine man is killed or injured at his machine sharing the risks with his boys, but more often he is away from the danger point, and death and injuries fall on the native workers alone, who have been left to themselves during the dangerous period of starting to drill a new round.

Transvaal G M. Estates

The following are the particulars of this company's output for the month of July, 1913:—Central Mines: Tons crushed, 12,500, yielding 8,567·739 fine ozs. Elandsdrift Mine: Tons crushed, 730, yielding 725·730 fine ozs. Vaalhoek Mine: Tons crushed, 1,470, yielding 527·154 fine ozs. Estimated value of month's output, £41,176; estimated profit for the month, £26,525.

POSITION AT THE KNIGHT CENTRAL.

Recent Development—A Contraction in Ore Reserves.

The ore reserves of the Knight Central Company have been completely re-estimated and at the end of June they stood as under:—

Reef.	Tons.	Value. Dwts.	Width. Ins.
Main Reef	240,800	6·4	62
South Reef	338,200	6·0	60
Main Reef Leader	7,600	8·5	38
Total	586,600	6·1	61

At the end of last year the payable ore reserves amounted to 647,000 tons of an average assay value of 6·1 dwts. over 62 inches, showing an increase of 2,700 tons over the previous year, the value being practically the same. It is thus evident that during the six months ended with June last there was contraction in the ore reserves of the mine to the extent of over 60,000 tons. The value remains at the same figure, but the stoping width is very slightly reduced. It cannot be denied that the development position of this mine leaves a good deal to be desired. The Knight Central property is intersected by what is known at the Simmer dyke, and it has been common knowledge for some time past that as there remains only a small amount of development still to be done north of the dyke (that is to say, in the portions of the mine nearer outcrop) there must be gradual depletion of the ore reserves during the next few months unless a large percentage of payable ore is opened up south of the dyke on the 13th and 14th levels from the west shaft and the 15th and 16th levels east shaft, since these are the only points from which it will be possible to open up any large quantities of ore during the next few months. That hopes as to the blocking out of any substantial quantities of ore from these points have been disappointed is evident from the report for the quarter ended with June last. During this period the footage driven, sunk and risen on reef south of the dyke gave poor results. The crosscut from the east shaft at the 16th level is 254 feet in, and there remains approximately 320 feet to reach the South Reef. The crosscuts through the dyke on the 13th and 14th levels at the west shaft and on the 15th level at the east shaft reached the South Reef at 590, 490 and 706 feet respectively. The Main Reef where struck in the crosscuts proved unpayable in each case, and driving was commenced on the South Reef. Altogether, 355 feet of this reef, averaging 3·1 dwts. over an estimated stoping width of 63 inches, have been sampled to date. This footage includes the following payable stretches, viz.:—On the 13th level 10 feet averaging 4·5 dwts. over 38 inches; on 14th level 75 feet averaging 5·3 dwts. over 67 inches; and on the 15th level 60 feet averaging 4·5 dwts. over 60 inches. The total payable reef so far exposed is 145 feet (or 41 per cent. of the length exposed), averaging 4·8 dwts. over an estimated stoping width of 62 inches. Exclusive of main crosscuts, ore passes and prospecting work, 1,725 feet, or 88·89 per cent. of the development work has been on reef. Altogether, 1,600 feet have been sampled. This comprises 730 feet, or 45·6 per cent., averaging 7·6 dwts. over an estimated stoping width of 51 inches, and 870 feet, or 54·4 per cent., averaging 2·7 dwts. over 54 inches. Meanwhile the sinking of the incline shafts from the 14th level west shaft and 15th level east shaft has been proceeding. The east shaft has been sunk 22½ feet to a total depth of 4,596 feet, and the west shaft has been sunk 72½ feet to a depth of 4,458½ feet, and timbered to 4,325 feet. In connection with the ore reserves, it should be remarked that in the latest estimate, no ore south of the dyke has been included.

BLASTING BY ELECTRICITY.

Further Tests at the Meyer and Charlton—A Cheap Method of Exploding Holes Described.

Electric blasting tests at the Meyer and Charlton mine have made further progress during the past week, and the results secured are understood to be quite satisfactory. In view of the likelihood of the practice being extensively adopted along the Main Reef series, attention may be directed to the following article which recently appeared in the *Engineering and Mining Journal* on an electric battery for blasting, by Mr. C. C. Semple.

> There is a notion entertained by many miners, that electric detonators cannot be used in blasting except in conjunction with a magneto machine or a lighting or power circuit, but comparatively few mines are lighted by electricity and still fewer are wired for power. Blasting machines are rather expensive, especially for the man mining on a small scale. In order that they may be used conveniently several machines will be needed on every working level, and in case operations are on even a moderate scale, the initial cost of adequate supply of blasting machines amounts to no mean total. Furthermore, the magneto machine is notoriously liable to get out of order and to be affected by dampness. Its mechanism is not easily comprehended by many miners who might be called upon to make their own repairs. It is these reasons, as well as vague notions entertained by some as to the difficulties of wiring, that are accountable for the fact that in mines fuse is still the favourite means of detonating explosives, even for work under water. The advent of first and second delay action detonators has made it possible to secure the desired intervals between the breaking of groups of holes in a round in electric blasting
>
> "A cheap blasting machine can be made by using dry batteries such as are usually sold for about 20 to 25c. each for electric call-bell work. While I have been unable to thoroughly test out such a battery, I have secured excellent results which warrant my suggesting the device to those who can. I have found that at least two caps can be detonated for each cell in the battery. This would indicate that a battery of eight cells should suffice for any ordinary drift round. The eight cells may be placed in a wooden box, conveniently in two rows of four cells in the row. The cells should be connected in series; one battery terminal being connected to one of two binding posts placed near together at one end of the box. The other battery terminal should be connected to the centre of a two-point switch secured to the end of the box near the two binding posts. One point of the switch should be connected to the second binding post; the second point of the switch, not being connected, is the off position. The box should be equipped with a substantial hinged cover, preferably locked in place, and a stout strap which may be slung over the shoulder for carrying the battery about. The operation is simple. The switch is carried on the off or blank point. The wires from the round are secured in the binding posts, and when ready to blast the switch is slipped over to the other position. The effect is, of course, instantaneous, unless an attempt it made to fire too many holes for the number of batteries used. While the flow of current is strong, the circuit is broken so quickly by the detonation of the charges that the dry cells should recover quickly and be serviceable for a long time. How long, I am unable to state, as I have not yet had opportunity to blast frequently enough to exhaust a battery. It is a simple matter to arrange such a battery so that the circuit may be tested by sending through a small current before switching on the full current of all the cells in series. I have found that 1 lb. of No. 22 copper magnet wire, wound on a spool for convenience, placed in the circuit of only one electric detonator, will enable one to send the current of one dry cell through the circuit without exploding the detonator. If, then, the battery box is so arranged with one cell in circuit with such a spool of wire for resistance, it will be possible to arrange a three-point switch in such a manner that the lead wires from the round may be attached to the binding posts while the switch is on the blank point. Obtaining a spark at the switch while making and breaking contact with the second point to which the single cell and coil of wire is connected, would indicate a closed circuit which will be fired upon throwing the switch over to the third point to which all the cells of the battery are connected. A still more elaborate device can be made by placing a cheap and simple galvanometer on the end of the box connected with the second point of the three-point switch and the one cell and resistance coil; the movement of the needle would then indicate a closed circuit much better than would sparking at the switch."

MINERS' PHTHISIS ON THE RAND.

Allegations by the Government Mining Engineer—"Speeding up" and its Alleged Dangers.

In addition to the extracts from the annual report of the G.M.E., printed in our last issue, the following passages may be quoted giving the views of that authority on phthisis and accidents :—

A careless and inefficient miner discharged from one property easily obtains work at another mine, and wanders up and down the Reef putting in bad work at a number of mines and assisting to increase the accident rate by his carelessness in dealing with explosives, weakening the strata with injudicious use of heavy machine drills, and heavy charges of explosives, and taking little heed to the dangers of badly supported hanging walls. In some of the deep level mines a want of systematic artificial ventilation must also affect considerably the health of both white and coloured miners, causing them to be listless and nonobservant, and reducing their efficiency and usefulness to a considerable degree. It does not seem possible that men who at the end of a day's hard work have to sit for an hour at a waiting station thick with dust and nitrous fumes, can day after day put in a good day's work, nor can a native, who walks a thousand feet up a stiff incline every day be really physically fit for his work on the following morning. If health conditions were improved better men would compete for the comparatively high wages on the Rand; both white and coloured miners would put in a better day's work, and it is reasonable to suppose that more intelligent white supervision would tend to reduce the accident rate. If these arguments were considered insufficient from a humanitarian point of view it might be further urged that improved health conditions by bringing better and more efficient miners might tend to actually reduce working costs and cause larger profits to be made. Working under unhealthy conditions, the efficiency of the unskilled miner must remain low, and a larger number of persons must be employed to do a certeain amount of work than would be under normal conditions.

"SPEEDING UP."

The strictures upon "speeding up" to secure large outputs are equally severe. The report states that with increased stamps and mills and increased departments the work of "speeding up" has to be resorted to to secure secure a large output. From the consulting engineer to the last joined gang of boys, everyone is rushed, so safety measures are apt to get scamped. Stopes are not properly inspected or trimmed down, packs are neglected, and the contractor, urged to do his utmost by those over him, takes risks which never were intended to be included among "dangers inherent to the industry of mining." There are cases where the white man gets killed or injured with his boys, thus sharing with them the result of his careless work or where he strenuously endeavours to protect the natives under his charge, but in many cases these consequences fall only on the natives, the white miner being away at the critical moment, or working away from the actual danger zone. If "speeding up" and rushing mining work to extremes is responsible for accidents, the responsibility rests principally with the controllers of the mines who determine the output on a scale which is frequently in excess of the labour complement available, and of the capacity of the mine and its shafts, and who have now to live up to the promises made to shareholders. The manager only increases his anxiety and trouble by forcing work to extravagant limits, the mine officials are averse to driving men and boys, and are incessantly worried with accidents to men and plant.

WORKING COSTS REDUCTIONS.

Continuing its strong remarks, the report says that at the present time attempts to reduce working costs are carried too far, and economies in timbering, waste packing, pillar cutting, and other safeguard to underground workers all tend to increase the possibilities of accidents. The Mines Department has more than once had to insist on an increase in the safety measures mentioned above, which has certainly for the present added to the working costs of the mine. In capital expenditure also a large saving can be, and has been, effected by straining mining risks to the utmost, and working with a large area with a single shaft. The decrease, however, in efficiency and safety resulting from this departure from one of the most important rules governing mining, makes it improbable that any further attempts will ever be made to save money by mining with single outlet.

MINERS' PHTHISIS.

Under the section devoted to mining hygiene considerable attention is given to miners' phthisis, and the report states that during the past year considerable attention has been devoted by the Department towards the improvement of the health conditions on mines. The report of the Medical Commission on Mines' Phthisis inducted that this disease was prevalent to a far greater extent than anyone anticipated, and that it was, contrary to general belief, not confined to men working rock drills, but was prevalent in varying degree amongst all classes of underground employes on the Rand. It was becoming more apparent, moreover, that the mining industry was beginning to suffer owing to the loss by death of the more experienced miners, and in the cessation in the flow of good miners from abroad, owing to the knowledge of the danger of working in the Rand mines. The recognition of these facts and the coming into force, during the year, of the Miners' Phthisis Act, found the leaders of the industry ready to co-operate with the Government in applying stringent remedial measures. A particularly serious and difficult matter to remedy is the large amount of dust created by blasting. If all men were out of the mine at blasting time, and if they were kept out until the dust had either subsided on the damp surfaces in the mine or had been cleared out by the ventilating current, no harm would result. It frequently happens, however, that blasting takes place before all persons on the outgoing shift had been hoisted; that it is impracticable to hoist all persons in the downcast shaft; that the persons actually doing the blasting are unable to get away from the resultant fumes and dust, or that the oncoming shift is brought down before the air is sufficiently clear. Now that dust at other times has been done away with by the abundant use of water, the deplorable conditions just mentioned are probably the chief remaining cause of phthisis, and the Department has been devoting particular attention to them. Considerable irritation has on several occasions been caused by what was thought to be an excessive use of its powers by the Department in stopping shifts when the conditions were found to be bad, but the Department holds that it would be lacking in its duty if it were to do otherwise. While ready to assist the mines in every possible way to tide over the difficulties created by its action, the Department has insisted upon the cessation of these bad conditions as far as practicable. In this matter it has, to a large extent, had the support of the controllers of the industry, but it has been a disagreeable surprise to find even on some mines on which remedial measures are carried out in an excellent manner that action was only taken under pressure from the Department. With the universally expressed desire of seeing miners' phthisis stamped out, and after the measures to be taken had been clearly indicated in the preliminary report by the Miners' Phthisis Prevention Committee, it would have been thought that such pressure was unnecessary. Data are now becoming increasingly abundant showing that the death-rate from miners' phthisis amongst white miners on the Rand is probably at least ten times as high as the death-rate from accidents. The necessity that the Department should pay great attention to the stamping out of the disease is, therefore, sufficiently obvious, and its activities are steadily devoted towards that object. The staff has been increased by four assistant inspectors of mines, one to each of the Witwatersrand Inspectorates, and increased inspection of the mines, with a special view to enforcing measures for the prevention of dust, is being carried out. Continuous inspection is probably more effective in this matter than it is in the case of accidents, for dust prevention is, on the whole, more largely dependent on conditions which must be constant than on the acts of omission or commission of individuals. The water service must be good, the mine must be kept wet in all working places and travelling ways, and fumes and dust must be dispelled. These are all conditions that lend themselves fairly readily to inspection. There are, however, other matters, such as the use of water while drilling and the blasting of the round immediately after the cut, the observance of which by all individuals cannot be effectively controlled by the inspectors. Reliance must be placed for these principally on the officials of the mine, the mine overseers, and shift bosses. They alone are sufficiently numerous to visit every working place at least once a day to see that the regulations for the prevention of dust, as well as of accidents, are observed. The practice of reporting offenders for the purpose of trial before an Inspectors' Court is being more largely adopted, and results in summary justice being dispensed without the great loss of time involved with a trial before a magistrate. In conclusion, the report states that if the foregoing text contains criticisms against the owners and administrators of the Witwatersrand mines, it is only fair to make any deductions possible in favour of their increased attempts to reduce the mining death-rate. The past year shows an improvement of .2 per thousand over 1911, and the cause can be analysed. It is not contended that inspection has been any more rigorous or useful than it was in the previous year, nor have the attendant dangers in mining been any less. Miners have been no better than they were before, neither has the native labourer become more intelligent. This small death rate reduction must, therefore, be attributed to the united efforts of controllers and managers, who in more ways than one have given proof that they realise what large room there is for improvement. If the frank criticisms contained in these remarks draw their further attention, and secure, as in the past, their co-operation in remedying the evils indicated, a useful purpose will have been served. The Department received useful assistance from those interested in mining in its attempts to reduce accidents, and is quite willing to acknowledge that among both owners and administrators there are men who regard the protection of persons as essential in mining. But, unfortunately there is the passive resister, the polite person who talks nicely, but will do nothing, and against this class of man, if he will not advance with the times, the department intends to bring the full force of the law to bear.

THE WORLD'S METAL STATISTICS.

Important Returns Showing Year's Output and Consumption of Tin, Copper and Nickel.

As in former years, so on the present occasion it may be of interest to draw attention to the well-known statistics issued by the Metall Gesellschaft of Frankfort-on-the-Main regarding the production, consumption, and stocks of copper, tin, lead, zinc, and other metals. The return, which is now made for the nineteenth year, states that the consumption of metals last year underwent such a large augmentation in general that it was temporarily impossible to keep step with the demand, notwithstanding the considerable expansion in the output. The return shows that the production of copper throughout the world exceeded 1,000,000 tons for the first time in history, the quantity having been 1,019,800 tons, as compared with 893,400 tons in 1911. The figures represent an increase of 14 per cent., whereas those for 1911 only experienced an advance of ·6 per cent. over the preceding year. As to the distribution of the tonnage among the different countries, it is mentioned that a considerable extension of the production took place in America, the north and south of which yielded 707,900 tons for the market, or 69·4 per cent. of the world's output. This quantity was 93,000 tons in excess of 1911. The hopes entertained with regard to the development of the copper deposits in the Katanga district of the Congo have hitherto not been realised. Concerning the world's consumption of copper, the return gives the total at 1,040,000 tons, as contrasted with 953,700 tons in 1911, and as the former was much greater than the output, the world's stocks had to be drawn upon to the extent of about 21,000 tons. The increase in the production of tin from 118,700 tons in 1911 to 123,100 tons in 1912 almost entirely devolved upon the Straits Settlements, which raised 61,528 tons in 1912, as compared with 57,944 tons in the previous year, whilst Bolivia occupied the second position with ore equivalent to 23,000 tons of tin, as contrasted with 22,200 tons in 1911. On the other hand, the world's consumption advanced from 120,600 tons in 1911 to 128,100 tons in 1912, only 2,400 tons of the increase applying to Europe. Germany participated to the extent of 21,700 tons, as against 19,300 tons in 1911; Great Britain consumed 21,500 tons, as compared with 21,900 tons; whilst the United States had a share of 51,700 tons, as contrasted with 48,000 tons in 1911. The augmentation in the latter case is attributed to the large expansion in the American export surplus of tin-plates—83,200 tons, as against 62,400 tons in 1911—to the detriment of the British export trade. In the case of zinc the production is returned at 977,900 tons in 1912, as compared with 902,100 tons, whilst the consumption amounted to 987,500 tons, as against 903,206 tons in 1911. The following tables show the production, consumption, stocks, and average prices in the past three years and the respective consumption of the four leading countries:—

PRODUCTION, CONSUMPTION, PRICES, AND STOCKS.

Copper—	1910.	1911.	1912.
Production in tons	887,900	893,400	1,019,800
Consumption in tons ...	913,700	953,700	1,040,200
Average price	£57/3/2	£56/1/9	£73/1/2
Stocks in tons on Jan. 1st	148,500	102,100	83,400
Tin—			
Production in tons	115,700	118,700	121,300
Consumption in tons ...	119,600	120,600	128,100
Average price	£155/6/2	£192/7/9	£209/8/5
Stocks in tons on Jan. 1st	20,300	19,580	14,150

CONSUMPTION OF THE FOUR PRINCIPAL COUNTRIES.

Copper—	1910.	1911.	1912.
Germany	209,400	222,100	232,700
United Kingdom	146,000	159,200	144,700
France	85,700	95,700	99,800
United States	339,900	321,900	371,800
Tin—			
Germany	18,200	19,300	21,700
United Kingdom	19,400	21,900	21,500
France	7,330	7,400	7,500
United States	49,900	48,000	51,700

The output of nickel throughout the world in 1912 amounted to 28,500 tons, as contrasted with 24,500 tons in the previous year, the United States and Canada having been jointly responsible for 15,000 tons and 12,000 tons in the two years respectively, and the average price remained at 3s. 3d. per kilogramme as in each of the three preceding years. A further development took place in aluminium, the output of which reached 61,100 tons, as compared with 45,000 tons in 1911. The first position is occupied by the United States and Canada, which produced 18,000 tons, as in 1911; France turned out 13,000 tons, as against 10,000 tons; and Germany, Austria, and Switzerland are credited with 12,000 tons, as contrasted with 8,000 tons in 1911. It is calculated that the world's consumption amounted to 61,100 tons, as compared with 46,800 tons in 1911, and 28,000 tons and 20,900 tons in the two years respectively apply to the United States. The average price was 1s. 6d. per kilogramme, this contrasting with 1s. 2d. in 1911 and 1s. 5½d. in 1910. In conclusion, the statistics record the production of quicksilver at 4,300 tons, or 200 tons in excess of the previous year, but the figures for silver are not available for 1912.

Witbank Colliery.

A dividend of 10 per cent. for the six months ending 31st August, 1913, equal to 2s. per share, has been declared payable to shareholders in the Witbank Colliery. In consequence of the reduction in working hours recently conceded to the miners, it will be necessary to add to the existing plant in order to be able to maintain the output as hitherto; further capital expenditure will also be incurred for the electrifying of the Uitspan plant, which has been decided upon. In view of this the board desires to have at its disposal additional cash resources to meet necessary requirements, and for this reason—although the profits of the second half of the company's financial year are more than sufficient to pay a dividend at the rate of 30 per cent. per annum—the board of directors considers it advisable to declare a dividend at the rate of only 20 per cent.—thus making a total distribution of 25 per cent. for the year ending 31st August.

Zaaiplaats Tin.

The results for the month of July, 1913, are:—Days run, 27·4 days; ore milled, 2,880 short tons; residues re-treated, 1,218 short tons; concentrates won, 115 long tons; average value of concentrates, 70·25 per cent. metallic tin; estimated profit for the month, excluding Government tax on profits, £8,428 9s. 3d.; add adjustments in respect of estimated values of previous shipments, £3 15s. 9d.; profit declared for the month, £8,432 5s. 0d.; capital expenditure, £25.

Springs Mines.

The following cable has been despatched to this company's London office: "South shaft reef now fully exposed; average assay value 5·81 dwts. over 53·69 inches. Publish immediately."

THE GERMAN WEST AFRICAN DIAMOND FIELDS.

Authoritative Account of Past Results and Future Prospects.

IMPORTANT information as to the position of the diamond industry in German South West Africa is contained in a recent Consular report. The year 1912 was an epoch making one. During the first six months operations were severely curtailed. Lack of labour, the pressure of taxation, dissatisfaction with the manner in which the output was disposed of, and the unsettled question of the liability of claimholders to pay claim licence, combined to depress the industry and to keep the output at a very low level. In September the previous best output record was broken, and succeeding months improved upon September. The change is due to a more or less satisfactory solution of the difficulties indicated.

Taxation.—The most far reaching reform that was introduced was in connection with taxation. Previous to 1912 taxation and royalties claimed from 16 1 6 to 50 11-12 per cent. of the gross value of the output. In addition, the diamond monopoly, which controlled the sale of the diamonds, took a further 5 per cent. for its services. The result was that as soon as working costs approached half the value of the output, mining became unprofitable. In one instance a company paid over 1,000,000 marks in taxes, and ended up with a deficit for the year 1911.

On December 30, 1912, the amended diamond taxation ordinance was published. The tax payable is based upon the following formula: If S be the tax, V the value realised from the sale of the output, and B the working costs, then $S = 0.66\ V - 0.70\ B$. In other words, if the sale price of the stones be £100 and the working costs £50, the tax is £31, or 62 per cent. of the net profit. With working costs at £90 the tax is £3, or 33 per cent. of the net profit. When the working costs amount to 95 per cent. of the sale price no tax is payable. The ordinance lays down the nature of the books to be kept, and the manner in which working costs shall be ascertained and so forth. As regards the calendar year 1912 producers have been given the option to choose whether they will pay taxes under the old law or under the new, as companies with very low working costs will have to contribute somewhat more under the new tax than under the old. In the meantime the companies have had time to adjust themselves to the altered conditions, and devise methods which will enable them to work rich and poor gravel together in a rational manner, instead of exploiting merely the richer patches. As soon as the main principles of the tax and the certainty that it would become law became known, it had the immediate effect of stimulating production.

The Government has met the mining companies in the matter of the diamond monopoly also. Hitherto they have had practically no voice in the disposal of their output, which the monopoly controlled. It has now been decided to issue sufficient shares in the monopoly to the producers to give them an equal voice in the management. It will be the first endeavour of the newly-constituted monopoly to foster free competition for the purchase of the output in order to obtain higher prices than have been obtained in the past. The charge made by the monopoly for its services has been reduced from 5 to 2 per cent. A long-standing grievance has thus been removed.

A further concession has been made in respect of claim licences, which affected a few companies in the fields south of the 26th degree and all the fields in the area north thereof. Under the old mining law the claims in question were subject to a claim licence of 30 marks per annum. This does not sound very much for a diamond mining claim, but from the nature of the occurrence in German South-West Africa, where the stones are spread over large superficial areas, the licences formed a considerable item in the expenditure sheet of poor-grade claims. The force of this has been recognised, and the claims, which were formerly liable to pay 30 marks per annum, will now only pay 1 mark 50 pf. per annum. The concession in conjunction with the altered taxation will make a considerable difference to the poor grade claimholders.

Output—Another most important achievement during the year 1912 was the settlement which was effected between the various claimants to the Pomona Mine. The company, which was formed to exploit the diamonds in this area, entered into the list of producers in September with an output of approximately 28,000 carats. This is insufficient to account for the great increase in the output for that month, which is due to greater activity all round, and the resumption of work upon claims which had been allowed to lie idle pending a settlement of the taxation question. It was well known that the area in which the Pomona Mine was situated contained claims which carried larger stones than the average for the diamond fields. As long as the boundaries of the property and the ownership thereof were in dispute it had to lie undeveloped. The stones found there are much larger on the average than the stones found elsewhere. Just beyond the Pomona boundary a diamond weighing between 33 and 34 carats has been discovered. This is the record stone to date. In appearance it is of excellent colour, and seems to be a piece of some larger stone. Quite apart from the weight of the monthly output, its value lies in the fact that it brings up the average price per carat on account of the size of the diamonds. During 1913 the tax on the Pomona diamonds will be on the old basis, and it will be the policy for the company to rob the rich patches and leave poorer gravel to be treated at a later date, when the reformed method of taxation becomes applicable. It is estimated that the average output of the mine for the year will be over 50,000 carats per month. The price realised will be considerably higher than the average price of the smaller stones previously found on other claims. The effect upon Government revenue will be of great importance, as Pomona alone in 1913 will probably yield as much revenue as all the other fields put together did during 1911, while the renewed activity on all sides will swell the total.

Since the discovery of the fields in 1908 there has been a rapid yearly increase in the output, interrupted only in 1911. The following table shows the figures of production and official valuation, that in the case of last year being estimated:

	Carats	Marks
1908	39,375	51,180
1909	483,268	15,135,522
1910	867,290	26,860,071
1911	717,162	23,034,118
1912	992,350	29,768,100

There was a large increase in the output in the final quarter of last year, for with the entry of the Pomona Mine into production and the general stimulus to working owing to the revision of taxation, the previous monthly average of 60,000 to 70,000 carats was raised to over 100,000 in September, and increased to 137,000 carats in December.

The only true picture of the state of the German diamond market is that given in the annual reports of the diamond monopoly. As the financial year of the monopoly closes on the last day of February each year, the following figures, taken from the last report, include two months which really belong to the year 1913. The monopoly disposed of 902,157 carats (816,296 carats) during the year and realised 26,190,000 marks (20,898,600 marks), an average of 29 marks 3 pf. per carat as compared with 25 marks 6 pf. per carat in the previous year. The increased value per carat is largely due to the increased size of the diamonds, which ran 6.09 to the carat as compared with 6.5 to the carat in 1911. The prices varied between 26 marks 50 pf. (for stones which averaged 6.79 to the carat) and 33 marks 86 pf. per carat for stones which averaged 5.25 to the carat. As stated above, the increase in the average size of the diamonds is due to the Pomona output.

Mining operations have been begun in a tentative manner on the fields north of the 26th degree. A considerable amount of local capital has been invested in these fields, and the question is whether they can now be made to pay. If they prove payable it will have as much effect, relatively, upon the trade and prospects of the citizens of Luederitzbucht as the more ambitious properties, whose shares are mostly held abroad, and will have to pay a large percentage of their profits to the Treasury. The Colonial Mining Company has decided to take over a number of the northern claims, and has contracted to spend at least £15,000 on them during its first working year. Under the new taxation the company can work its claims in the south and north fields as if they were one concern, and the taxation formula makes it possible for the company to work the north fields at a loss without sacrificing total profits. Up to a certain percentage the loss falls upon Government revenue.

Labour.—The next important factor in the prosperity of the industry is the labour question, which has never been so acute as during 1912. Under the old scheme of taxation only the cheapest labour available could be employed with advantage. Ovamboland is the source upon which the Chamber of Mines principally relied. In 1911, 5,607 labourers were required and 3,696 were obtained. In 1912 the complement was 4,232 and only 2,316 were obtained. The reasons for the shortage are complex. The Chamber of Mines is of opinion that, excellent as the effect of the improvement in the comfort of the labourers may be as an inducement to recruits to come forward, it will be necessary to build a railway line connecting Otjivarongo with Ovamboland, and to occupy and administer Ovamboland itself in order that the steadying effect of a civilised Government may minimise the obstacles which a barbarous regime inevitably places in the way of orderly development. Meanwhile no improvement in the labour supply was observed, and though at the time of writing the full complement of labour for 1913 seems fairly well assured, a permanent supply cannot be relied on. Endeavour were made to obtain labourers from India; China was suggested; all the other German colonies were applied to, but for various reasons none of these efforts met with success. The influence of the new method of taxation made itself felt at this crisis, as it enabled the mining companies to engage Cape coloured labourers, of whom there are well over 1,000 at present on the fields. Under the reformed basis of taxation 70 per cent. of the increased working costs due to the employmente of higher priced labour are borne by the Government revenue, which has therefore a great and direct interest in opening up and developing sources of cheap labour.

Plant.—Mechanical appliances find increasing use in the mining operations. The evolution of the present Schiechel machine from the hand-machines employed in 1908 and 1909 is very interesting. The latest type combines a number of improvements, and is provided with a double set of pulsators, so that the gravel which is put through the machine is washed twice without the consumption of extra power. The result is that the number of stones lost in the debris is infinitesimal. The Luederitzbucht Electric Works, which supply the town with light, also generate power, which is used for driving machinery on some of the mines. The central works, which the Koloniale Bergbau Gesellschaft is erecting for the purpose of dealing with large masses of sand and gravel, are approaching completion. The electric pumping station at Elizabeth Bay is in working order, and supplies the Colonial Mining Company and the Colmanskop, Limited, with water for washing the gravel. The Colmanskop, Limited, has constructed a narrow gauge line from its property to the station Klomanskuppe, which is also the junction of the narrow gauge line of the Colonial Mining Company, which runs to Elizabeth Bay. A light line has also been constructed from Prinz of Wales' Bay to Bogenfels, and passes through Pomona en route.

Geology.—In previous reports various theories as to the origin of the German South-West African diamonds were referred to. It is generally accepted that they originated in a "pipe" or "pipes," and that the distribution over the areas in which they are found was due to the action of wind and water. A favourite theory is that the distribution was carried on by the agency of the current, which sets northwards along the coast, at a time when the present coastline was still submerged. On this theory it would appear as if the vicinity of Pomona was a centre from which distribution took place, and considerable interest attaches as to what development work will reveal. During the past year it has been found that the gravel deposits in many places are deeper than was thought. Diamonds are also found in soft calcareous stone, which has been deposited upon the bedrock of gneiss and schist, which forms the framework of the country. In the valleys in which the diamonds are found depressions occur which are filled with sand, gravel and limestone, much as a pool is filled with water. These depressions vary in depth and extent and contain diamondiferous earths, which have not been concentrated by the action of the wind. The problem now to be faced is to discover cheap methods of working through large masses of sand and gravel in order to get at the diamonds. At present there is little certainty as to what the future holds in this respect, and all previous estimates as to the life and output of the diamond fields require revision under the altered conditons as regards taxation and the expansion to be expected from improved mechanical appliances. No new discoveries have been made, while several "pipes" in the Gibeon District were examined and proved blind.

Electrical Accidents.

The report of Mr. G. Scott Ram, H.M. Electrical Inspector of Factories, on the accidents which occurred in electrical works in England in 1912 has been issued. As usual, many of the accidents were due to the negligence or inadvertence of skilled men, who were perfectly acquainted with the nature and extent of the dangers amongst which they were working. It is impossible entirely to eliminate this class of accident; risks must be taken in almost every branch of engineering, and they are daily faced by our engineers with a cool daring which at times verges on foolhardiness. Unfortunately, there is still no effective means of distinguishing the live wire or switch from harmless, uncharged metal; various detectors have been invented, but in practice they are seldom used, even in the rare event of their being at hand. Some automatic device is badly needed, similar to the paint which changes colour when it is heated, so that live metal could be distinguished at a glance. Perhaps such a device will one day be forthcoming. Far too many accidents are due, year after year, to the careless or improper use of portable apparatus supplied through flexible conductors. The Home Office has done its best to guard against such accidents, but it is clearly impossible to prevent occasional infraction of the rules, and the only course that appears to offer any prospect of improvement is the rigorous prosecution of the responsible authorities whenever the breach can be brought home to them. The convenience, which is so valuable a characteristic of electricity, carries with it the inherent liability to abuse on the part of ignorant or careless users, and the penalty, unfortunately, is too often a heavy one indeed. Frequent and regular inspection of *all* electrical apparatus ought to be an imperative rule in every workshop where motors and portable apparatus are employed. Failing the prevention of accidents, the next best thing is to mitigate their consequences as far as possible. As Dr. Reginald Morton has pointed out, death from electrical shock is only an apparent death at first, and there is almost always a period, long or short, during which it is possible to resuscitate the victim by immediate recourse to artificial respiration.

MINING MEN AND MATTERS.

The mine managers' examination is fixed for September 24, 25 and 26.

* * * *

His many friends on the Rand will regret to hear that Dr. Franz Boerckel, of the Central Mining and Investment Corporation, is returning to take up his permanent residence in Europe. It is possible that Dr. Boerckel may re-visit the Rand in two years.

* * * *

The following have been appointed members of the Council for the South African School of Mines and Technology:—Mr. Alexander Aiken, *vice* Dr. Corstorphine, resigned; Mr. Theodore Reunert, *vice* Sir Thomas Price, resigned; and the Mayor of Johannesburg, *ex officio*, as an additional member.

The July Diamond Output.

The total returns of diamonds found and actually sold on Western Transvaal diamond fields during the month of July amounted to 7,547½ carats, value £37,727. It is stated that a large number of stones have been held over owing to the scare of alleged market rigging. The weight of diamonds has been maintained, but owing to the great drop in prices the value has fallen considerably. The following is a list of licences issued and revenue received from the various diamond diggings during the month of July:—

	Licences.	Revenue.
Bloemhof	747	£220 15 0
Mooifontein	50	14 0 0
Panfontein	53	14 0 0
Weltevreden	2	0 10 0
Avondster	38	13 10 0
Zwartlaagte	54	19 10 0
London	55	16 10 0
Eastleigh	218	75 10 0
Goedgenoeg	83	21 15 0
Modderkraal	15	4 15 0

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Transvaal Tin Deposits.

To the Editor, *South African Mining Journal.*

Sir,—In the last paragraph of your extract from the report of the Inspector of Mines, Pretoria, you leave out a line, by which it appears that the granite was injected beneath the norite. If you will refer to the original you will note that the passage should read:—"If the bushveld granite was originally a laccolite, then a section through the mass would—to borrow a metaphor from the kitchen—be similar to that through a pie-dish and pie; the pie-dish would correspond to the norite lining of the laccolite, the meat of the pie to the granite intrusion, and the pie-crust to the sedimentary rocks beneath which the granite was injected." I shall be obliged for the correction.—Yours, etc.,

JNO. W. J. TREVOR,
Inspector of Mines, Pretoria District.

Pretoria, 16th August, 1913.

Selborne Shield Competition, 1913.

To the Editor, *South African Mining Journal.*

Sir,—I have the honour to inform you that the abovementioned competition will take place in the Recreation Hall, Railway Headquarters Offices, opposite Johannesburg Station, Johannesburg, at 1 p.m., on Wednesday, the 27th instant; and although the rules stipulate that the public shall not be admitted to the competition, it is not intended that representatives of the Press should be excluded, and any member of your staff whom you may wish to attend will be welcome. Four teams, representing the four Provinces of the Union of South Africa, will participate in the competition, which it is expected will be concluded about 5 p.m. In the evening His Worship the Mayor of Johannesburg is giving a complimentary dinner in honour of the visiting teams, and prominent citizens connected with local ambulance work—as well as the Press—will, I understand, be invited.—Yours, etc.,

V. E. DAVIS,
District Secretary.

Johannesburg, 19th August, 1913.

The Failure of the Recent Loan.

To the Editor, *South African Mining Journal.*

Sir,—In your issue of the 9th inst. you have an article under this heading. We all now know how monstrously ignorant the financial advisers of the Government are. The loan is supposed to be for the purpose of either finding a series of smaller loans already had and obtained, or partly this and partly to pay some creditors on a more or less open account. If the Government had only looked at the credit side of all the banks doing business in South Africa in their annual reports, it would have been seen they were asking for all the cash and balances of the various depositors in these institutions: to all intents and purposes this is all the available money in the country, most of it is used in the various businesses of the depositors, and very little indeed is banked on fixed deposit for the interest, and even what there is, is naturally used by the banks, thus enabling them to earn their 10 per cent. dividends. This shows simply the folly of the proposition. Further, in your article you suggest making the insurance companies invest the £6,000,000 required, presumably in cash. There are three local insurance offices: The African Life, The Southern, and the S.A. Mutual, who together have funds about seven millions. These funds are invested locally, although one of them has more money than it knows what to do with, but these companies all earn considerably more than 4 per cent., so this amount of interest is of no persuasive power to them. You might commandeer or confiscate the lot, but it would not tend to raise the credit of the companies or the Government. Please, sir, bear in mind these funds are all employed, and what an enormous financial cataclysm would be caused if they were to adopt the high-handed, drastic measures of our bankers. In the example you give of the Canadian law of insurance companies you rightly state the "actuarial reserve" of the insurances in force have to be invested in Canadian securities, and so they are to the extent they are not *bound* to invest them in Canadian Government securities, for if they were they would lose one of the greatest features of the enormous business they do. For it is the private person who wants a loan, or a public company, or a municipality, from all and sundry of whom the insurance company gets its real legitimate business; in other words, they grant the loan, but the borrower has to insure himself, themselves, and their friends. These mortgages are accepted as Canadian securities. At the present time our Government require a deposit of £10,000 for each company doing business in South Africa, and the law is not uniform in the various States comprising the Union. In the Transvaal the deposit usually takes the form of the 5 per cent. Transvaal loan as being the best, but the Government will take mortgages. Again, you forget the Government have deprived the incentive to lend on mortgage to the farmer, by cutting the rates of interest to lower than what they offer as borrowers themselves, and the higher rates the companies can easily get elsewhere. I will presume the present deposits with the Government of all the various insurance and assurance companies as £1,000,000. This sum is composed of various sums, various people have already received, and is not an asset of the Government for them to pawn or pledge or spend in any way. Otherwise it would be a forced loan and perilously near confiscation. The whole fault as a loan is the smallness of the interest offered. Raise the interest to 5 per cent., issue the bonds at par, draw at certain stated intervals for redemption, and make a provision so that the Minister of Finance could buy in the open market the bonds when he has funds in hand and the sellers quote a price to suit him. As a local effort there is not and never will be a market for £6,000,000 Government bonds. Suppose a holder of £20,000 bonds wanted to realise for imperative reasons and was forced by anyone or anything to sell, they would drop like hailstones and be of as much intrinsic value. To criticise after the event is wisdom, to smash windows is heroic, but to reconstruct is the difficult thing. Certainly our credit as a community is in a parlous plight. What with the idiotic strike, the unbridled mob hooliganism, our utter inadequacy to cope with riotous mobs, all these tend to put us back among the Bulgarian States, but we have been in a worse position before and have pulled out all right.—Yours, etc.,

"INSURANCE."

State Lotteries and the Recent Loan.

To the Editor, *South African Mining Journal.*

Sir,—"Finance," your correspondent in your issues of the 9th and 16th, has two different methods whereby he suggests to help the Cabinet out of its hole or to raise the six millions they are asking for. In his first letter, he advocates the issue of State bonds and suggests various prizes ranging from £15,000 to £5. Incidentally, he raises the question of gambling, and he is bold enough to say the money would come from England. If it did so, it would be against the law of England, and also of this country, all of which would have to be altered to meet his views—a most laborious undertaking. He proposes to offer for £3,000,000 interest at, say, 3 per cent. to give half yearly drawings of £45,000 in 1,133 prizes. We will suppose it is all subscribed for and the first drawing has taken place and the prizes distributed to the various lucky ones. Has it ever struck him about the unlucky ones, men who have invested their money for nothing? Does he think the investor is such a fool as to put his money into a venture when, according to him, he makes no provision for redemption? Further, there are, according to the 1912 census, some 373,000 white males over 21 years of age in the Union. Where is the market if anyone wants to sell? In Germany, Belgium and France there are some one hundred and forty millions of people, and they have been more or less used to this form of investment, but even then you can see quotations on the Paris bourse for these various bonds below par, and especially in bad times or after a drawing the fall in value is most pronounced. Again, none of the Governments of these countries encourage these forms of investment, but allow them, simply from their old custom, and no doubt they will shortly be prohibited altogether. I do not know if "Finance" knows how the Continental bonds originated, but it may interest others. In bygone times, money was wanted for improvements by specially go-ahead continental municipalities; there were no financial markets available; the citizens in those days kept their money in the proverbial stockings, and these go-ahead Burgomasters wanted them to lend it for use or misuse in the towns they supervised—hence the loan and the lottery. It appealed to the ignorance of the citizen, but it was only for a few thousand guelden, thallers, marks or francs. It has grown in thousands, but is not a fashionable form of investment nowadays. I am in entire accord with "Finance" and your good selves that insurance companies should retain here in this country a distinct proportion of the funds they receive in the way of premiums, but if "Finance" knows anything of insurance, he will know that any company that gives 30s. per cent. in the way of bonus is giving away 3 per cent. compound interest on premiums as well as insurance in case of premature death, and I shall be very glad to write all the business he can introduce at 3 per cent. interest per annum for any amount. There is a saying, "The fault of the Dutch is giving too little and asking too much." If ever a saying was literally true it is in this matter of the loan of £6,000,000. Declined in England and offered to us "arme boeren" at 3¾ per cent. The Government plead they want to help the people of South Africa "and themselves," yet they don't mind asking us for money at this inadequate rate of interest and at the same time lending it to their supporters at the ridiculous rate "Finance" proposes, viz., 3 per cent. The whole thing is so utterly absurd one wonders out of which particular kind of backveld hayseed the scheme originated.—Yours, etc.,

"FLUTTER."

Our Need of Capital, and why we can't get it.

LANDOWNERS THE REAL CULPRITS.

To the Editor, *South African Mining Journal.*

"We have found that the requisites of production may be reduced to three: labour, capital and the materials and motive forces afforded by nature. Of these, labour and the raw material of the globe are primary and indispensable. (Book I., Chap. VII.)

"The requisites of production being labour, capital and natural agents, the only person, besides the labourer and the capitalist, whose consent is necessary to production, and who can claim a share of the produce as the price of that consent, is the person who, by the arrangements of society, possesses exclusive power over some natural agent. The land is the principal of the natural agents which are capable of being appropriated, and the consideration paid for its use is called rent." J. S. Mill: "Principles of Political Economy," Book II., Chap. XVI.)

Sir, As you say in your issue of the 9th inst., "General Botha declared, in a striking message to the London financial papers, some time ago, that the most pressing need of South Africa to-day was more capital, and evidence of the fact grows daily more evident." Some months ago, in the House of Assembly, he said, "What we want is capital and labour." I have never heard of him mentioning a scarcity of the other "indispensable" factor in production, land, but we cannot blame the Premier for his total neglect of this essential factor, when we find that he is but following the example of all South African company promoters. As I, myself, am one of the several-times-bitten-a-hundred-times-shys, I have not looked in the advertisement pages of your Journal for company prospectuses for several years, but looked in the current issue to find an illustration to this letter. I could not find one, and is it any wonder? All I could find was the notice of one in liquidation and the assets of another one for sale. We must imagine one. Let us call it Jim Jam G.M. Co., Ltd., with a nominal capital of £15,000, divided as follows: To vendors (in shares), £5,000; to vendors (in cash), £5,000; working capital, £5,000. We investors, local and oversea, all remember, to our sorrow, the multitude of companies and syndicates floated some years ago with prospectuses like the above. Now here we have a case in which, after having eaten half our cake, we have multiplied the remaining half by three, and made the cake bigger than it was at first. We started with a capital of £10,000. We gave half of it, along with another half which never existed, to the vendors, and yet in our prospectus we still say that we have a capital of £15,000. A certain capital, like all other matter, can only be in one place at once, so how the dickens can the £5,000 we gave the vendors, in hard cash, still be part of our capital? How the poor old alchemists would have delighted to have lived in our progressive age, when, with nothing but the stroke of a pen, and hardly a moment's thought we can turn £5,000 into £15,000. No wonder we are surprised that finance like this fails to attract the capital of the world. In this case the £15,000 should have been apportioned as follows—to land £10,000—to capital £5,000, so now let us proceed to divide up the product, if any, amongst the three factors of production. Let us imagine (I admit that it requires a considerable stretch of the imagination) that after the factor, wages (in which must be included directors' fees), has had its share that there remains, after a year's work a surplus of £1,500. This £1,500 we would then return as a 10 per cent. profit, or interest on capital. As a matter of fact it would be 30 per cent. if returned as interest on capital, as £1,000 out of the £1,500 should be returned not as interest but as rent, as it is really a return for the use of land. The same thing applies to the farmer. A man buys 5,000 acres for £5,000. He then borrows £2,000 at ? per cent. to stock his farm. He has a bad season and—the next we hear of him he is looking for a billet in a battery, and is telling everyone that farming in this country does not pay; that he, himself, started with £5,000 capital and went smash in one year. He did not start farming with £5,000 capital. The man from whom he bought the farm had that. What he started with was 5,000 acres of land, and Robinson Crusoe, on his land, was better off than he. Where is the enormous capital of the world flowing to, at present, and why? Is not a great stream flowing to Western Canada, and why? To get a truthful answer to the last question we must stick to the principles of political economy and ask ourselves how the produce of Western Canada, be it wheat, timber, or tinned salmon, is divided amongst the factors of production, labour, capital and land, remembering always that if the one factor gets too big a share the other two must get just that much less. "Oh," I hear your readers say, "but what's the use of comparing Western Canada with this country? Western Canada has this, that and the other thing that this country lacks." Yes, but do let us be honest and put the advantages of South Africa against those of Canada. Can we not work out-of-doors all the year round? And have we no other advantages to put against theirs? Ask Dr. William McDonald, the Government agricultural expert. Ask the pages of this Journal. Anyhow, we will never tell what South Africa is capable of unless people are allowed to get at it and try. We hear that South Africa must first be opened up, but the funny thing is that the more roads and railways we construct the less population and capital are attracted. We hear that stock and plant diseases must first be eradicated, but, at the rate we are now going on, by the time the noxious parasites and insects have disappeared, the white population will also have left, and there will be little need for capital. We hear that what we want is cheaper labour. Ah, now we are getting on the scent, but let us still be honest and make quite sure that it's the fox we are chasing and not a red herring. We find that capital is not getting its fair share of the produce (be it gold, diamonds, mealies or whale oil, converted into £ s. d.), so we pounce on the good old scape goat, labour, forgetting in our haste that all producers, even you, Mr. Editor, must be included in the term, and that the less produce portioned to labour, the smaller the portion of each and every producer, and so we say that the cost of labour is too high and that we must import a cheaper labourer from Timbuctoo. In the meantime we have quite lost sight of the other essential factor, land, so let us before starting for Timbuctoo give it a look up. We have quite a lot of it (in which we must remember is included all natural resources, even climate) in South Africa, so why is it not being developed? Perhaps if we re-read what J. Stuart Mill says we may find the answer there: "The person who . . . . . possesses some exclusive power over some natural agent (land) is the only person, besides the labourer and the capitalist, whose consent is necessary to production, and who can claim a share of the produce as the price of that consent." May not this be the answer—that the land owner claims too big a share and that there is not enough left to satisfy capital and labour? We can either rent land or capitalise the rent by buying it outright, in which case we should call the interest which we should otherwise have had on that capital, rent, or the land owner's share of the produce. Land and capital are two different things, and so also are their share of the produce, rent and interest (although we are constantly mixing them up), so that if we have to pay too much of the produce as rent to the land owner, by having to pay too much for his land, there is the less for capital or labour, both of which will leave for countries where the land owners will accept a smaller share. There is nothing to force the land (or natural agent) owner to sell except at his own price, while we can do nothing with our capital or labour without his land. Perhaps they manage otherwise in Western Canada, perhaps they tickle the land owners a little bit there and induce them to accept a smaller share. Yours, etc.,

MATHER SMITH.

P.O. Noord Kaap August 19, 1913.

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Rhodesian Section.

LATEST MINING NEWS.

The Wanderer's Year—Lonely's Record Output—Susanna Mines—Mining in Northern Rhodesia—Globe and Phoenix Developments—Bechuanaland Exploration Company.

THE ordinary general meeting of the Wanderer (Selukwe) Gold Mines, Ltd., was held on Thursday in mail week at the Cannon Street Hotel, E.C. Mr. Edmund Davis presided, and, in moving the adoption of the report for the year ended April 30 last, observed that it had been found necessary to abandon work on the Camperdown, which had been let on tribute, but it was satisfactory to note that there was a possibility of developing available ore reserves on the Wanderer property. He then read a cable giving the latest information about the property as follows:—"Estimate total tonnage on new shute from cross-cut 3 west to be 60,000. In three months this ground will be ready for stoping. Impossible to state assay value accurately. Feel confident will be not less than 2 dwts. 12 grs. Available tonnage in old Wanderer stopes about 25,000. It seems very probable that with small patches of ore quite recently found in Ashton and Kemerton will be able to supply sufficient ore to keep output on 12,000 tons per month basis until new stopes in Wanderer are open; 2 dwts. 12 grs. ore give about £700 profit per month; 3 dwts. grade would increase to £1,750. Consider safe estimating £700 per month profit. Latest developments are satisfactory." The report was adopted.

* * * *

July's gold output from the Lonely mine was declared on the 8th inst. and was a "record" for the property. The tons; yield, 1,832·345 ozs. fine gold. Slimes treated, 5,810 tons; yield, 3,217·370 ozs. fine gold. Total recovery, tons; yield, 1,832·345 ozs. fine gold. Total recovery, 5,049·715 ozs., valued at £21,229 18s. 2d.

* * * *

Susanna Mines: Winze 11 to 12, north shoot: Sunk 6 ft. to a depth of 65 ft.; at 55 ft. reef 68 ins. wide, assays 5·8 dwts.; at 60 ft. reef 75 ins. wide, assays 7·6 dwts. Spur reef, eleventh levels: Advanced 1 ft. to a distance of 91 ft.; at 90 ft. reef 66 ins. wide, assays 8 dwts.; at 85 ft. reef 52 ins. wide, assays 9·8 dwts. Winze 10 to 11, south shoot, has been sunk 5 ft. to a depth of 40 ft.; at 30 ft. reef 30 ins. wide, assays 11·5 dwts.; at 35 ft. reef 20 ins. wide, assays 16·3 dwts.; at 10 ft. reef 22 ins. wide, assays 19·2 dwts. A feature of the development on the lower levels is the width of reef being exposed, the last 20 ft. of spur reef showing an average width of 57 ins. The values give 7·9 dwts. per ton. In winzes 11 to 12 the width of reef for the last 30 ft. averages 65 ins. and the values 12·8 dwts.

* * * *

A correspondent at Fort Jameson sends the following notes on recent mining work in North Charterland to the *Rhodesian Mining Review*:—Lutembwe Gold Belt: On the Lutembwe East Mine, No. 1 shaft and No. 3 shaft have been connected on the 2nd level exposing a pay shoot 373 ft. in length. The reef here averages 4 ins. in width, and has an average value of 41 dwts. As the reef is very narrow it has been deemed advisable to winze down to the 3rd level before ordering the reduction plant. Consequently these have now been started, the width of the reef in the winzes is normal but the values are higher. At the end of May 3,875 ft. of development had been completed in the district on the various reefs pegged. Sasare Gold Belt: The Sasare mine ceased milling on the 17th May, as practically all the oxidised ore above No. 5 adit has been worked out. The mine is now closed pending development below No. 5 level in the sulphide zone. It is hoped shortly to erect a cyanide plant to treat the accumulated sands which have been added to for the past six years whilst the mill was running. Makali Reef: Development is being pushed ahead on this reef, and No. 1 shaft is sunk over 80 ft., the reef in this section averages over 36 ins. in width and assays 14 dwts. Ndazi Reef: Some rich values were recently struck in No. 1 winze, samples assayed up to 72 dwts.; development work is now being pushed ahead. Everything here points to a good mining year, after the abundant rains we had, which totalled over 53 ins.; there is an abundance of native foods, and labour on the various mines is plentiful.

* * * *

The annual report of the Bechuanaland Exploration Company states:—The company's operations for the year resulted in a profit of £5,503 2s. 7d., but the directors have decided that the sum of £17,058 8s. 2d. should be written off mining claims and investments, thus converting the profit into a loss of £11,555 5s. 7d., which amount has been taken to the balance sheet, thereby reducing the amount standing to the credit of the profit and loss account to £11,659 9s. 11d. It was anticipated from the encouraging results of the earlier development work at the Gothic and Pagamesa claims that these properties would be able to bear the whole of the prospecting expenditure incurred in the Lower Gwelo district. The Board has, however, now decided that the expenditure on the Loongana, Esquire and the Minoru properties shall be written off as well as a portion of the expenditure on the Elumba mine. The amount thus written off, viz., £14,618 16s. 7d., is included in the above sum of £17,058 8s. 2d. Owing to the conditions of the share market and the low prices prevailing, business has necessarily been greatly restricted, precluding the opportunities of making any considerable profits during the period under review. The directors regret being unable to recommend the payment of any dividend in respect of the past year. The company's investments have been brought into the accounts at the 31st December, 1912, at cost or under. The market quotation at 31st December, 1912, of such holdings as were quoted showed a net depreciation of £22,969 16s. 2d., but taking into consideration the various causes responsible for the general market depression the directors consider that such depreciation in values is of a temporary nature only and does not in any instance reflect the intrinsic value of the investment.

* * * *

The following shows the developments on the Globe and Phoenix mine during the month of June, 1913:—New main shaft, total depth, 1,039 feet. 12th level, drive north, No. 1 crosscut, east No. 1 rise, has advanced 31 ft. Average width of reef 11 ins., average value over 30 ins., 4 dwts. No. 12 level, drive north, No. 1 crosscut east No. 1, winze has advanced 16 ft. Average width of reef 10 ins., average value over 30 ins., 8 dwts. 19th level, east portion, drive north from 1a winze, No. 1a rise has advanced 18 ft. Average width of reef 27 ins., average value over 30 ins., 41 dwts. 20th level, drive north, from No. 1 winze 19th-20th levels, has advanced 11 ft. Average width of reef 21 ins., average value over 30 ins., 23 dwts. 20th level, drive south from No. 1 winze 19th-20th levels, has advanced 12 ft. Average width of reef 15 ins., average value over 30 ins., 2 dwts.

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20th level, drive north, from No. 2 winze 19th-20th levels, has advanced 36 ft. Average width of reef 15 ins., average value over 30 ins. 4 dwts. 20th level, drive south from No. 2 winze 19th-20th levels, has advanced 69 ft.; average width of reef 11 ins., average value over 30 ins., 1 dwt. Cross-cutting for the month, 15 ft.

* * * *

Summary of report of the London and Rhodesian Mining and Land Company received by mail:—"Radnor mine: No. 1 shaft was sunk 13 ft., total 201½ ft.; from 195 ft. to 197 ft. a mineralised vein was passed through, assaying 10½ dwts. over a width of 26 ins. The north crosscut towards the lode was commenced at 200 ft. (No. 2 level) and advanced a distance of 5 ft. (Office note.—Cabled information since received states that the lode was cut at 18 ft. in, assaying 12½ dwts. over the first 6 ft., total width not exposed.) The winze 78 ft. west of No. 1 shaft was sunk a further 13 ft., total 49 ft., below No. 1 level, assaying 2 ozs. 10 dwts. over 18 ins. Kelly's Option: No. 2 shaft, 110 ft. level: The east drive was advanced 43 ft., total, 73 ft.; from 30 ft. to 65 ft. assaying 5¾ dwts. over 19 ins. West drive extended 59 ft., total 93 ft.; from 40 ft. to 75 ft. assaying 11·4 dwts. over 17 ins. Koodoo Claims: No. 2 shaft: Started driving west in dyke; preparing for sinking. New Home: Started sinking three prospecting shafts on two lines of ancient workings, from which a quantity of ore showing visible gold has been obtained. Shaft No. 3: Cut stringer at 24 ft. down, assaying 2 ozs. 10 dwts. over 8 ins."

* * * *

The ordinary general meeting of the Bechuanaland Exploration Company, Limited, was held on Monday in mail week, at Salisbury House, E.C. Mr. Edmund Davis presided. and moved the adoption of the report for the period ended March 31 last. They recommended, he said, the payment of a dividend at the rate of 4 per cent., which would absorb £7,533, leaving £982 to be carried forward. They had interests in farms, mining claims and rights, town sites and buildings, less amount written off, standing in the accounts at £18,198, comparing with £12,979, or an increase of about £5,200, the difference being principally accounted for by their purchase of land and town sites. They had in cash, loans, and debtors a total of about £29,000, and with regard to their investments, there was at date some depreciation which it was hoped would be recovered before the next annual meeting. Mr. Cromwell Hockley seconded the motion, which was unanimously adopted.

THE ASSOCIATION OF GOLD DEPOSITS WITH ACID IGNEOUS ROCKS IN SOUTHERN RHODESIA.*—I.

[By H. B. Maufe, B.A., Director.]

THE METAMORPHIC ROCKS.

General Geological Structure.—It is a well known fact that a large part of Southern Rhodesia consists of Metamorphic rocks, commonly known as "schists" or "formation," and granite; and that the "schists" lie in elongated belts of varying width, flanked by broad masses of granite. The latter are of the form known as "bathyliths." A closer acquaintance with the known bathyliths show that they are largely biotite-granites having a strong banding or gneissic structure well developed around their margins. The banding is in most places parallel to the edge of the mass and to the strike of the neighbouring schists, whilst the schist-belts widen and narrow, conforming in their strike to the outline of the bathyliths. This structure is admirably displayed by Mr. F. P. Mennell's Geological Map of the Mining Districts of Matabeleland.[1] It shows the granite bathyliths ten to thirty or more miles in breadth separating relatively narrow and winding belts of "schist," whilst the outcrops of banded ironstone indicate how the strike of the "schists" conforms to the edge of the granite bathyliths.

Classification.—The rocks which go to make up the schist-belts may be divided into three series as follows:—

(1) A series consisting of three groups:

  (a) Greenstones and greenstone schists including epidiorite; hornblendic, chloritic and talcose schists; serpentine; and rocks of intermediate and perhaps acid composition. The group probably includes volcanic rocks and intrusive sills, and is doubtless capable of sub-division.

  (b) Banded ironstone with subordinate black and grey phyllites and limestones.

  (c) A group of conglomerates and grits, associated in Lomagundi with limestones, etc. The group is considered to be younger than the preceding one, but the exact relationship is not known. It is a possibility to be borne in mind that the conglomerates in different parts of the Territory are not all of the same age.

(2) A series of ultra-basic intrusions now represented by serpentine and talc-schist, which contain chromite and asbestos.

(3) A series of acid intrusions of varied character, but frequently altered to porphyroid and sericitic-schist.

The members of series (1) are strongly folded and are generally found dipping at high angles (60° or more) away from the granite bathyliths. Series (2) is intrusive into series (1), and series (3) into series (1) and (2). Series (3) has not hitherto been recognised as a distinct one, but as a result of this recognition and a consideration of the distribution of the gold deposits of the Territory, it appears that a relation exists, which it is the object of this report to point out.

This classification is admittedly a tentative one, and as indicated above, it is quite likely that series (1) will require to be split up further. It is inadvisable, therefore, to suggest names for the series at the present time. It is sufficient to make it clear that the three series of more or less schistose rocks, together with the granite bathyliths build up the ancient Metamorphic system of Southern Rhodesia.

Age.—The age of the system is not a matter of immediate importance. The system as a whole appears to be continuous across the Limpopo River with the Swaziland system of the Transvaal, which is generally assigned to the Archaean. No more definite conclusion can be arrived at in the present stage of our knowledge.

Theory of the Geological Structure.—The general similarity between the Rhodesian Metamorphic system and the Archaean of Canada has been pointed out by several geologists. The hypothesis applied by Professor Coleman[2] to the explanation of the Canadian structure seems equally applicable in its broad outlines to Rhodesia. The structure implies the upwelling of molten granite in a plastic state into mountain domes accompanied by the sagging of the overlying rocks into intervening troughs. The molten granite being lighter than the overlying rocks, it is supposed that if the latter were unequally thick, the granite would well up beneath areas bearing the lightest loads. The rising of the granite bathyliths would thus be due to differences in gravity and not to lateral thrusts accompanying the building of a mountain chain.

Although structures produced by crushing after consolidation are not wanting, the banding of the gneissic granites often appears to be a flow-banding due to movements taking place during crystallization, and the partial granulation of minerals sometimes observed, likewise appears to be due to movements occurring before complete consolidation had been effected. The theory quoted above explains these phenomena in a simple manner, and at the same time it accounts for the coincidence between the strike of the schists and banding of the gneisses, for all are the effects of one general process which must have taken up an immense period of time for its completion. The theory also emphasizes the striking differences from such an area of metamorphic rocks as the Highlands of Scotland, where intense lateral compression has given a dominant trend to folds of Alpine type.

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*Southern Rhodesia Geological Survey Bulletin.

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THE ACID IGNEOUS ROCKS OR "FELSITES" OF SERIES (3).

Characteristics.—The great variability of these acid rocks has already been alluded to. Not only do they vary in texture from fine-grained granites to branded or flinty rhyolites, and also afford a certain amount of variation in mineral composition, but they have suffered metamorphism in different degrees, being converted in some cases into a thorough schist. In the neighbourhood of lodes they have frequently undergone extensive alteration by the mineral-bearing solutions, and when to this is added the complete oxidation which has taken place in the weathered zone above water-level, their identification is attended with no small difficulty. It is only natural that in these circumstances they should have been named in various ways, and that even parts of a single mass should have received two or three different names which hide the fact that geologically the body can only be considered as a unit. It is in fact a difficult matter to find a suitable name for the whole group. It is thought that the somewhat indefinite term "felsite" is the most suitable, since a felsite groundmass is very common. Many bodies might equally well be called porphyry, though the porphyritic structure is not as a rule conspicuous in the hand specimen. The passage from a porphyry through a porphyroid into a sericitic schist or phyllite has been found to take place in several cases, and has recently been noted by Dr. Wagner in the Darwin District.[3]

It is hardly desirable to enter into a detailed description of the many petrographical variations here. Some of these have already been dealt with in Bulletin No. 1, by Mr. Zealley, where it is shown that in a single mass the texture of the rock may vary from a flinty looking felsophyre to a finely crystalline rock crowded with quartz and felspar phenocrysts. In other instances, such as the mass occupying portions of the farms Chirinika, Rutherdale, and Robin Hood, situated south of the Shamva Mine, the interior of the mass is practically a fine-grained granite.

Facies fairly rich in black mica or hornblende are occasionally found amongst the coarser-grained varieties, but the fine-grained forms are poor in ferromagnesian minerals and consist almost entirely of quartz and felspar.

Varieties are formed by the appearance of a strong banding, due sometimes to alterations of coarser and finer textures, sometimes to alterations of bands of slightly different mineral composition. Such banded masses, especially when altered in the neighbourhood of mineral lodes, or even when simply weathered, may present a very strong resemblance to a succession of sediments. The occurrence of breccias may increase this resemblance, or suggests the presence of a volcanic series consisting of lavas and agglomerates.

The banding and brecciation where they have been studied most carefully, seem to be, like the banding of the gneissic granites, original structures due to movements taking place during intrusion and consolidation of the magma.

Again, several of these felsitic bodies can be shown to be intrusive. They cut across sedimentary beds such as the banded ironstone and throw off veins which penetrate the surrounding rocks. The flinty felsophyres have caused little contact alteration of the enclosing rocks, but instances may be quoted from the Enterprise District in which the coarser-grained rocks have caused induration and contact alteration, especially the production of chiastolite in the black slates occurring with tho banded ironstone. In other cases the action of simple contact metamorphism by the igneous rock has been obscurred by the passage of mineral-bearing solutions which have themselves brought about mineral changes.

These felsitic masses form bodies frequently having an irregularly oval outline, and measuring along their long axes anything between 100 yards or so and two or three miles. Sometimes the outline is nearly circular, or again the body may be very long and narrow, but definite dykes or sills with parallel walls are uncommon.

In the oxidized zone the felsites are usually pale in colour, but below water-level they frequently take on a dark tint without, however possessing the weight of basic rocks or banded ironstone. Especially in some banded varieties the presence of a dark mineral, which in some cases at least is graphite, gives the rock a very dark gray or black colour.

To sum up it seems that these felsites are intrusive rocks and that many of their peculiarities are due to movements taking place in the magma during consolidation. It is, however, a possibility not to be forgotten that there may exist a group of acid volcanic rocks amongst the Metamorphics. Mr. Zealley has already drawn attention to the presence of highly felspathic rocks amongst the Greenstones of the Gatooma District. Should a thoroughly acid group of volcanics be discovered amongst the rocks of series (1), it might in some cases be very difficult to distinguish them in a satisfactory manner from these intrusive felsites.

Relation to the Granite Bathyliths.—As remarked elsewhere, in the central portions of the larger masses the rock frequently becomes coarser in texture and sometimes passes into a granite. Conversely, the granite bathyliths occasionally show fine-grained felsitic varieties on their margins. For instance the felsitic rock which underlies large portions of Glenborne, Stoke and The Springs farms in Enterprise passes on Borrowdale by insensible graduations over a belt some yards in width into the large mass of coarse-grained granite which covers an immense tract of country to the northwards.

In the absence of analyses the composition of the granites and felsites cannot be compared, but from a consideration of the mineral constituents it is easy to see that they may have been derived from a common magma.

Age of the Felsites.—Everywhere the granites and felsites appear to be younger than series (1), and in the Selukwe District it has been shown that they are later than series (2), and without contradictory evidence from other districts. The relative age of the granite bathyliths and felsite intrusions has not been proved, but it is clear that they may belong to the same epoch.

We have already had occasion to point out that the intrusion of the granite bathyliths must have occupied a long period of time, and that their intrusion seems to have been attended by extensive crustal movements. It is now suggested that the felsites were intruded at intervals during the course of these crustal movements. This hypothesis allows of an explanation of the varying degree of foliation which has affected the felsites. It is clear that those masses which consolidated early might be involved in later movements, sheared and perhaps have a foliation induced; other masses might have flow banding and flow brecciation produced in them by movement during consolidation; whilst the latest intrusions might escape dynamo-metamorphism altogether without necessarily belonging to a later geological epoch.

The fissile structure frequently noticed in replacement ore-bodies and on the walls of lodes affects the felsites equally with other rocks occurring in a similar position. It is obviously a secondary structure, but what its exact relation may be to the more general movements discussed above has not been proved.

Considering the whole of the evidence, the probability is that the felsites were derived from the same earth-magma as the granite bathyliths, and that they were intruded at intervals during a period in which crustal movements and the intrusion of the granite bathyliths also took place.

(To be continued.)

New Kleinfontein.

The following cablegram was despatched to the London office of the New Kleinfontein Company last Saturday:—"In view of the recent industrial strike of white workers and the unrest caused thereby, the marked shrinkage in the native labour supply, and the consequent uncertainty as to the results of the operations of the company during the next few months, the board of directors consider that the safest policy for the company to pursue at this juncture is to delay the consideration of the dividend till December. The financial position at the 31st of July shows net liabilities, including bank loan, £102,250. The improvement in cash position since the 31st of December last is £99,140. Floating assets, not available and not taken into calculation, £43,360. It is hoped that the operations of the company from now to December, 1914, will permit of reasonable dividends being distributed to shareholders for both years, and effect the speedy liquidation of the balance of the liabilities of the company."

Assays and Analyses of Minerals.

NOTICE TO PROSPECTORS AND OTHERS.

The attention of Prospectors and others is invited to Notice No. 1037 of 1913, appearing on page 679 of the *Union Government Gazette* of the 29th July, 1913, which specifies a special schedule of fees for the assay and analysis of minerals fixed for the benefit of prospectors and others who are financially unable to make their own arrangements.

The above notice can be seen at all offices of the Mines Department in the Union.

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THE WEEK IN THE SHAREMARKET.

Quiet, but Steady—Waiting upon London—Outlook Improving.

The market continues dull and lethargic with little business doing. Towards the close of the week the London cables came easier, and this added to the prevailing quietness. An improvement may, however, be seen at any moment, as things generally are on the mend, and a forward swing of the pendulum is overdue. The few fluctuations of the week are shown below:—

	Friday, 15th.	Sat., 16th.	Mon., 18th.	Tues., 19th.	Wed., 20th.	Thurs., 21st.
Adair Ushers ..	—	0 6B	0 6B	0 6B	0 6B	0 6B
African Farms ..	14 9B	14 9	14 6B	14 6B	14 6B	14 9
Apex Mines ..	16 6B	18 0B	18 6B	18 0B	—	18 3B
Bantjes Consolidated	16 3B	16 6	16 0B	—	15 9B	15 6B
Benoni Consolidated	2 6S	2 0B	2 3S	2 0B	2 0B	2 0B
Blaauwbosch Diam.	—	85 0B	85 0B	87 6B	—	90 0B
Brakpan Mines ..	58 6B	58 0B	59 6B	59 0B	59 6B	60 0B
Breyten Collieries	27 6B	27 0B	28 0B	28 0B	—	28 0B
British S.A. ..	20 6B	20 6B	21 0B	20 6B	20 0B	—
Bushveld Tins ..	1 0S	0 9S	—	—	0 6S	0 6B
City & Subs. (£4) ..	42 0B	41 6B	42 0B	42 0B	41 6B	41 0
City Deeps ..	53 9B	53 0B	53 6	54 0	54 0	53 6B
Cloverfield Mines ..	4 0B	4 0B	4 0B	4 0B	4 3	4 6B
Clydesdale Colls. ..	—	—	8 0B	8 0B	8 0B	—
Cons. Langlaagtes	26 0S	25 9S	26 0S	26 0S	26 0S	24 6B
Cons. Main Reefs ..	18 0S	17 0B	17 0B	16 6B	17 6S	17 0
Coronation Freeholds	0 5B	0 5B	0 5B	—	0 5P	—
Crown Diamonds ..	10 6	10 3B	10 6B	10 9B	10 9B	10 6
Crown Mines ..	130 0B	—	—	—	—	—
East Rand Centrals	8 0	7 9B	7 9B	7 6B	7 9B	7 9B
East Rand Coals (2/6)	1 10B	1 10B	1 10B	1 10B	1 11B	1 11B
East Rand Deeps ..	1 6B	1 6B	1 6B	1 6B	1 6B	1 6B
East Rand Props.	—	46 6B	46 0B	45 6B	45 0B	45 6B
East Rand Debs. ..	—	—	—	—	—	£90
Eastern Golds ..	—	1 3B	1 3B	1 3B	1 3B	1 3B
Frank Smith Diam.	8 6	8 3	8 3	8 3B	7 10	7 3
Geduld Props. ..	21 0	—	20 6B	20 6B	—	20 6
Geldenhuis Deeps	25 0B	—	—	—	—	—
Ginsbergs	20 0B	—	—	—	—	—
Glencoe (Natal) Colls.	7 3B	7 3B	7 3B	7 3B	7 3B	7 3B
Glynn's Lydenburgs	13 0B	13 0B	—	—	—	—
Government Areas	20 6	20 3	20 3B	20 6	20 6B	20 9
Jumpers	4 6S	—	4 6S	—	—	—
Jupiters	5 6B	5 6B	5 6	5 0B	5 6B	5 0B
Kaalfontein D. (2/6)	0 3B	0 3B	0 3B	0 3B	0 3B	0 3B
Klerksdorp Props...	1 11B	1 11B	2 1	2 0B	2 0B	2 2B
Knight Centrals ..	8 3B	8 3B	8 0B	8 0B	8 0B	8 0B
Lace Props. ..	3 1B	3 1B	3 0B	3 0	3 0B	3 0
Langlaagte Est. ..	22 6B	—	—	—	—	—
Luipaardsvlei Est.	4 0B	3 6B	—	—	—	—
Lydenburg Gold Fms	3 3S	3 3S	—	3 3S	3 3S	2 9B
Main Reef Wests ..	8 6B	8 9	8 6B	8 6B	8 6B	8 9B
Main Reef West Debs.	—	£60B	£60B	£60B	£620B	£65
Meyer & Charltons	101 0S	—	—	—	—	—
Middlevlei Estates	1 3	1 0B	1 0B	1 0B	1 6S	0 10B
Modder B's.. ..	76 0B	76 6B	77 6	—	—	—
Modder Deeps ..	28 0B	28 0B	29 6	30 6	30 0	29 3
Natal Navigation Col.	—	14 6B	14 9B	—	—	—
New Boksburgs ..	—	0 6B	0 6B	0 6P	0 6B	1 0S
New Eland Diam.	—	—	—	22 0B	—	—
New Era Cons. (5/-)	—	6 9B	6 9B	6 9B	6 9B	6 9B
New Geduld Deeps	1 9B	—	1 10B	—	2 0	1 9B
New Kleinfonteins	19 6S	18 6B	19 0B	18 6B	19 0B	18 6B
New Modders ..	225 0B	—	—	—	—	—
New Primrose ..	27 6B	—	—	—	—	—
New Unifieds ..	14 3S	14 3S	14 3S	12 0B	14 3S	14 3S
Nigels	16 0B	—	—	—	—	—
Nourse Mines ..	31 3B	—	—	—	—	—
O.F.S. & Trans. Dia.	—	1 6B	1 8	1 7B	1 8	1 8B
Premiers Def. (2/6)	227 6B	—	—	—	—	—
Premier Pref. (5/-)	170 0B	—	—	—	—	—
Pretoria Cement Co.	48 6B	48 6B	48 6B	48 6B	48 0B	—
Princess	5 0	4 9B	4 9	4 0B	5 0S	5 0S
Rand Collieries ..	—	2 6B	—	2 6B	2 6B	—
Rand Klips ..	1 3B	1 6S	1 2B	1 3B	1 6S	1 2B
Rand Mines ..	126 3B	—	—	—	—	—
Rand Nucleus ..	—	—	2 3S	1 9B	1 9P	1 9B
Randfontein Deeps	3 6B	3 6	3 6B	—	3 6B	3 6B
Randfontein Estates	26 9B	26 9B	27 0B	26 6B	26 6	26 6
Roberts Victors ..	30 0B	30 0B	30 0B	30 0B	—	—
Robinson	50 0B	—	—	—	—	—
Robinson Deeps ..	31 0B	31 0B	31 6B	31 6B	31 0B	—
Rooiberg Minerals	28 3B	28 0	28 0B	27 6B	27 6	27 9B
Rood. Durban Deeps	20 0B	—	—	—	—	—
Ryan Nigels ..	3 0B	—	—	—	—	—
Salisburys	1 6S	—	—	—	—	—
Shebas	4 9B	4 9B	4 9B	4 9B	4 9B	4 9B
Simmer Deeps ..	2 6B	—	—	—	—	—
Simmer & Jack ..	10 0B	—	12 0B	12 0B	—	—
S.A. Breweries ..	39 6B	39 6B	39 6	39 6B	39 6B	39 6
S.A. Lands ..	3 0B	3 3	3 1B	3 0B	3 2B	3 2
Springs Mines ..	17 0B	18 3	18 0	16 3	16 0	15 9
Sub Nigels	10 0B	9 9B	9 9B	9 9B	9 9	9 6
Swaziland Tins ..	41 0B	—	—	—	—	—
Trans. & Delagoa ..	35 0B	—	35 0B	—	—	—
Trans. Coal Trusts	36 3B	37 0	37 3B	36 0B	36 3	36 3B
Trans. Cons. Lands	21 0B	—	—	—	—	—
Trans. G.M. Estates	51 0B	52 6S	51 0B	51 0B	51 0B	51 0B
Van Ryn Deeps ..	29 6B	29 3B	29 9B	29 9	29 3	29 3
West Rand Cons. ..	9 0B	—	—	10 0B	10 0B	—
Witbank Colls. ..	42 0B	42 0B	42 0B	41 6B	42 0	40 0B
Witwatersrands ..	66 6B	—	—	65 0B	64 0B	67 0S
Wit Deeps ..	53 9B	53 0B	53 0B	—	51 6B	52 0B
Wolhuters	13 6B	13 6B	13 3B	13 0B	13 0B	13 6B
Zaaiplaats Tins ..	37 0B	37 0B	37 3B	36 6	35 9B	36 3B

B Buyers. S Sellers.

East Rand Proprietary Mines.

The report on operations for the three months ended the 30th of June at the East Rand Proprietary Mines states that from 501,000 tons milled 176.656·596 ozs. of gold were recovered. The estimated revenue from gold was £742,611, or 29s. 8d. per ton milled. Working expenditure absorbed £471,310, or 18s. 10d. per ton, which left working profit for the quarter at £271,302, or 10s. 10d. per ton. The profit for the quarter was increased to £282,224, the addition of £10,922 being profit derived from the treatment of 21,532 tons of accumulations. From this profit must be deducted approximately £50,353 to meet the quarterly proportions of the Transvaal Government profit tax, interest on debentures, etc., the details of which are as follows: Undermining rights annuity, £6.218; interest on debentures, £17,070; estimated Transvaal Government 10 per cent. profit tax, £20,135; payments on account of French fiscal taxes, £608; miners' phthisis compensation fund, £6,322; a total of £50,353. The expenditure on authorised votes for the quarter was £79,515. The approximate cash position at the 30th of June was, after providing for all liabilities, but exclusive of the debenture issue of £1,400,000, £502.668; less cash assets (stores and materials, sundry debtors, payments in advance, etc.), £111,136; balance, approximate cash position, £391,532. In the mine, 253 feet of shaft sinking was accomplished. On development 17.221 feet were driven, risen and sunk, the footage sampled being 13,860 feet. The average reef width was 24 inches, and the average assay value over the reef width was 10 dwts. The actual expenditure on development amounted to £49.238, as against £75,150 provided in the working costs (at 3s. per ton milled), leaving a balance of £25,912 7s. 11d., which, added to the balance at the 31st of March, 1913, of £155,965, gives a total of £181,877 standing to the credit of development suspense account at 30th June, 1913. This amount has been treated as a liability and is allowed for accordingly in the cash position shown above.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME

His Majesty's Theatre.—Mr. W. E. Holloway's Company ...	8.15
Standard:	See bills.
Empire	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9

INVESTORS' DIARY.

The following company meetings have been announced:—

Aug. 26.—Glynn's Lydenburg (Special).
Aug. 26.—Transvaal Gold Mining Estates (special).
Aug. 29.—Treasury G.M.
Sept. 9.—Coronation Collieries.
Sept. 12.—Swaziland Tin.
Sept. 19.—Transvaal Gold Mining Estates (special).
Sept. 19.—Transvaal Gold Mining Estates.
Sept. 26.—Simmer and Jack Prop.
Sept. 26.—Sub-Nigel.
Oct. 29.—Rooiberg Minerals.
Oct. 31.—Knights Deep.

Engineering Notes and News.

Important Government Laboratory Tests.

WIRE ROPES FOR DEEP LEVELS.

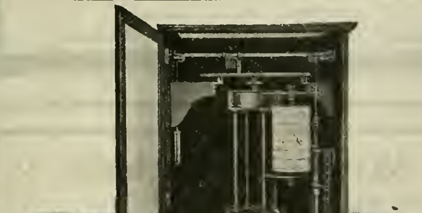
As hitherto, the large majority of the tests made by the Laboratory attached to the Mines Department were the bi-weekly tests of ropes used for raising and lowering persons, as required by the Mines and Works Regulations. Regarding these rope tests, the most noteworthy feature—not dealt with in previous annual reports—is in connection with the larger sizes of ropes installed in some of the deep level mines. Large compound construction ropes (six strands of 15/9/6/1 or 15/9/3 ordinary lay) were tested, the tensile stress of the material being about 280,000 lb. per square inch. The breaking load of the whole rope varied from 91.5 to 75.3 of the aggregate breaking load of all the wires composing it. This greater falling off in strength which occurred in some cases was adjudged to be due to the insufficient diameter of the "Hemp" main core. This supplied insufficient bedding for the strands during the whole rope test, and allowed the wires of adjacent strands to come into contact with and "nick" one another. This "nicking" of the adjacent strands was proved by subjecting another specimen of the whole rope to a load of about 65 per cent. of the breaking load of the rope; the strands of the rope were then opened out, and it was plainly seen that "nicking" of the wires of adjacent strands had taken place. A number of tests were made on wires to detect the class of wire most suitable for use in wire ropes used in compound or other shafts where winding ropes are subjected to specially severe working conditions. The wires were supplied by manufacturers and tested in the fatigue testing machine. In this machine the wire under severe tensile stress is subjected to successive reversals of bending stress. Tests were made with tensile stresses varying from one-half to one-seventh of the ultimate. The curves obtained from these tests, when plotted, showed clearly the differences in the qualities of these wires and the most suitable class of wire to be used for these purposes. A number of cement tests were made for the public which do not call for special mention, except in so far that they proved that it is now possible to obtain cement manufactured in this country equal to any imported from other countries. A large number of bricks were tested on behalf of the South African Engineering Standards Committee. As that body is publishing its own report on these tests, it is only necessary to reiterate what was said in the 1911 report: "That bricks are procurable within the Union, the crushing stress of which exceeds that of Staffordshire blues." A number of tests were made to ascertain the crushing stress of "Kimberlite" from a diamond mine where the most suitable reduction process was in course of settlement. These specimens were found to vary between 2.482,000 lb. and 325.000 lb. per square foot, according to the amount of weathering of the kimberlite. A few tests were made to ascertain the efficiency of welds made by the oxy-acetylene process on mild steel flat plates. These tests showed that the strength in tension of the welded portion (reduced to ordinary plate thickness) varied from 72.6% to 79.9% of the strength of the plates unwelded. The crushing tests conducted on behalf of the Mines Trials Committee were concluded during the year. These were carried out on cement spheres and on granite and cement cubes, the sizes varying by steps from ½ inch to 4 inches. The result of the tests made with falling weights showed that under impact the strength of the specimens to resist crushing varied in a way nearly dependent on the square of the diameter. This result corresponds with the well-known crushing law of Rittinger.

Course of Study for Surveyors.

In the course of a paper read before the members of the Chemical, Metallurgical and Mining Society on Saturday evening, Mr. Alexander Richardson, President of that body, touched on the subject of the training and qualifications of a mine surveyor. In view of the scope of the profession and to help students to select the subjects for speical study, he had drawn up a syllabus embracing those subjects, which were arithmetic, algebra, geometry and mensuration, trigonometry, geology and mineralogy, mine valuation, surveying, and miscellaneous. There were some elementary matters in which he recommended specialised knowledge; a mine surveyor would find that familiarity with time-saving arithmetical devices was very useful. Having gained his certificate, the surveyor would probably be appointed to a small mine. On entering on his duties his first care would be to ascertain what plans were in existence, and if they had been prepared in accordance with the Government regulations, and that sufficient essential data existed to enable him to carry on and bring them up to date. Were the plans in arrear an underground survey would be the first step, provided that it had been ascertained that the instruments required no adjustments. In the surveys a certain amount of overlapping should be done, and during this work lines had to be found for developers to work to, and contract work had to be measured up. There were many other tasks to which the surveyor would be called on to devote attention, such as making a thorough study of the faults and dykes in order to assist the manager in correlating them and forecasting conditions in deeper levels. The ore reserves would periodically have to be recalculated, and this work would call for considerable judgment in determining which blocks might be legitimately classed as developed, the stoping widths likely to be obtained in breaking the ground, the best way of arriving at the value of those blocks whose peripheries had been irregularly or incompletely sampled, and in estimsting the value of many other factors not amenable to rule. He would, if ambitious, keep the mine manager's certificate and the mine manager's position in view, and endeavour, by taking an active interest, if possible participation, in every phase of underground work, with a studious regard for the surface departments, in order to qualify himself for taking control of the mine should it ever become his privilege to do so. This, said Mr. Richardson, closed his address, and he hoped that in it he had been fortunate enough to touch on some points of interest to them.

Steel Pipes versus Cast-Iron Pipes.

At the present time some water, gas and sewage works engineers are being tempted to put down steel pipes instead of cast iron, owing to the saving in capital expenditure, without thoroughly looking into and comparing the risks attached to steel and the ultimate cost of same. It is most important that members of corporate bodies, who have the settling of these matters, should have before them all the facts obtainable before arriving at a decision as to which material to adopt. Owing to the thinness of the steel pipes, and the liability of corrosion, the life of a steel main is entirely dependent upon its protective covering, and,



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4. Measurement of CYANIDE, Oil, Acid or Alkali liquors.
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A TEST WAS CONDUCTED BY THE NATIONAL PHYSICAL LABORATORY ON A "PRECISION" METER SHOWED AN ERROR OF CONSIDERABLY LESS THAN 1 PER CENT. PRICES *ARE* LOW. *ASK FOR LIST M/31.*

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as corrosion takes place most rapidly where the steel main rests upon the ground, and where it is practically impossible to re-coat the pipes, it is perfectly plain to anyone that if corrosion once commences, nothing can stop it. Engineers who have had experience with steel mains are mostly agreed that its use is limited to: (1) Very high pressures; (2) temporary purposes; (3) physical impossibility to put down cast iron; (4) inability to raise sufficient money for initial cost of cast iron. The following is an extract from the *Port Elizabeth Herald* of January 29th, 1913: "A long debate on the Waterworks took place at to-day's meeting of the Town Council, when it was stated that seven million gallons of water were being lost monthly between the waterworks and the town owing to a leakage in the pipes. When the new waterworks were constructed some six or seven years ago, the town saved many thousand pounds in the cost of transport by laying down steel mains instead of cast iron. Washaways about a year ago revealed the fact that this steel pipe was not wearing at all well; in fact, at several points it was discovered to be completely rusted through. The defective pipes were replaced, but now it transpires that practically the whole main, covering a distance of over twenty-five miles, is affected, and will have to be replaced. The Council decided to delay action, pending a detailed inspection of the main by the Board of Works." There are many other steel and wrought iron failures, of which the following may be mentioned: The steel main over the Tay Bridge was laid in 1891 under the most favourable conditions, being protected from all climatic conditions by being enclosed in a wooden box. The main has been kept carefully coated with bitumen at a serious annual cost, but in spite of this it was found to be defective in 1910. The main is being replaced in cast iron. The Coolgardie main of 350 miles of 30 inch steel pipe was laid in 1903, and found defective in 1906. There are many other failures, amongst which are Rochester, U.S.A., twenty-six miles of 38 inch pipes defective in four years; San Bernada, U.S.A., defective in three years; Lockport, U.S.A., in two years; Bombay Port Trust in four and a half years; Pretoria, Ladysmith, Havana, Santiago, Madrid, Rome, Berlin, Metz, Gottingen, Antwerp, Paris, Orleans, Amiens, Nancy, etc., etc. Most of these, if not all, have been replaced with cast iron after a very few years. As against these steel and wrought iron failures, there is not a single known case of a failure in cast iron, except in one or two isolated cases, where the ground was such that possibly no material would have a long life. The life of cast iron mains is known to be over one hundred years, as the following cases will show:—(1) Versailles, 249 years; (2) Weilburg, 210 years; (3) Claremont-Ferrand, 165 years; (4) Glasgow, over 100 years; and the Vehar mains in Bombay, after fifty-five years' service, are now being lifted and relaid within the city. The foregoing remarks require no comment as to which material should be adopted by corporate bodies and others, if they take the trouble to study the question carefully on facts, and have the interests of the community at heart.

Healthier Conditions and Systems of Ventilation.

In his presidential address at the South African Institution of Engineers on Saturday evening Mr. Calder said that with regard to healthier conditions underground, there was only one way to obtain them, and that was by a complete system of ventilation. The prevalence of miners' phthisis, he continued, had driven home the fact that natural ventilation, on which we had depended in the past was totally inadequate. A ventilating fan and such dust-laying devices as were capable of maintaining a pure atmosphere, were now recognised as indispensable in the equipment of every mine. Several large fans with an air capacity up to 300,000 cubic feet per minute at $2\frac{3}{4}$in. W.G. were in successful operation, and the beneficial results encouraged our mining engineers in their efforts to make the mines of these fields as thoroughly and systematically ventilated as any dangerous gaseous mine. The speaker advocated the scheme suggested by Mr. C. H. Behrens, viz., that of placing electrically-driven air compressors at the bottom of down-cast shafts. Indeed, he might go farther, and advocate ventilating districts in the mine, each with its own compressor drawing its air from the main air intakes. The flexibility of electrical transmission had simplified many ventilating problems, and every arrangement which drew air into the mine and assisted the exhaust fan at the upcast shaft must be advantageous to a degree. As a result of our methods of mining, we left behind large worked-out open spaces that proved a danger to the stability of our mines, that were deterrent to efficient ventilation, and were a constant menace to the health of our miners. Kaffirs and other irresponsible persons had every access to those open places, and it was impossible for this reason to keep our mines in a thoroughly sanitary condition. These conditions were now happily being overcome by continual improvements that were being made in the methods of sand-filling. On certain mines the question of returning all current sand residues to the mine was being tackled in a resolute manner, and it was quite within bounds of possibility that this work could be done at very little increased cost over the present method of stacking sands on the tailings dump. Apart from the first and most important mining service that sand-filling performed in supporting and steadying the country, it was of inestimable value from the points of view of ventilation, health, and sanitation, particularly the latter and consequently the former.

Electric Smelting of Tin Ore.

The *Revue Industrielle* gives particulars of some experiments carried out by the Groendal-Kjellin Co., of London, in Cornwall, for the purpose of investigating the suitability of the electric furnace for the reduction of tin ore. The results were favourable, pure ores giving metal of 98 per cent. purity, while Bolivian ores containing 49·5 per cent. of tin and about 15 per cent. of iron yielded metal of 92 per cent. to 97 per cent. purity, which could be further refined to 99·75 per cent. or more by blowing air through the molten mass. The energy consumed amounted to 1,700 kw.-hours per ton on the average. By working with two furnaces, one to treat the rich slag and the other to produce the metal, the company hopes to reduce this consumption to 1,400 kw.-hours, giving an efficiency of 55 per cent. There is a saving of 25 per cent. of labour. It is stated that at mines where hydroelectric power is available, the process will be commercially practicable and economical.

The Springs Mines, wherein the mineral dust produced by mining operation, is in the opinion of the Minister of Mines of such a nature as to cause miners' phthisis, is added to the list under the Miners' Phthisis Act, 1912.

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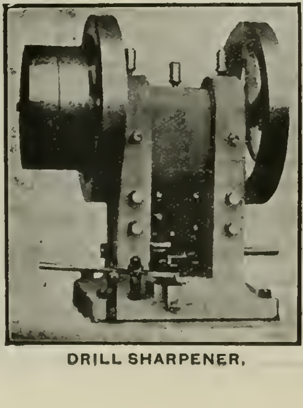

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STRIKE 1,000 BLOWS A MINUTE.

Chisel Jumpers up to $1\frac{3}{4}$in. guage sharpened at the rate of 4,000 a day.

50 Machines in use on the Rand.

The largest Mine on the Rand has put in four of these Machines the last year.

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Finance, Commerce, and Industries.

Union Customs Revenue.

The Customs imports and exports revenue collections of the Union for July, 1913, are as follows:—Capetown: Imports, £6,721,221; exports, £3,609,511; gross revenue duty, £83,759. Port Elizabeth: £813,604; £305,541; and £87,968. East London: £296,691; £62,003; and £36,224. Durban: £379,624; £1,051,512; and £96,580. Johannesburg: Revenue duty, £69,026. Lourenco Marques: Imports, £559,850; exports, nil; revenue duty, £21,490. Other ports and stations: £47,492; £92,668, and £22,321. General Post Office revenue duty was £8,225. The total value of imports, £2,769,482; value of exports, £5,121,235; gross revenue duty, £425,596. The Capetown exports included gold. The duty collected by Magistrates of the Orange Free State is not included.

* * * *

Mozambique Sugar.

In the *Bulletin of the Imperial Institute*, a former Director of Agriculture of Mozambique, writes on the progress of the sugar industry in that Province. He says that the output of sugar in 1910 was over 30,000 tons, but that it is safe to predict that in 1914 this figure will be nearly doubled. The valleys of the Inkomati, Buzi, and Zambesi rivers which are proving the most attractive to sugar planters, are low alluvial plains which extend in the case of the Zambesi for a length of 150 miles. Above the limit (say 35 miles from the sea) of serious flooding—in which description is not included submergence for three or four days only, provided there is no devastating torrent—the conditions for sugar planting are ideal, though preference is always to be shown for the black alluvium that the heavy, luscious canes require, and sandy outcrops are avoided. The many kinds of cane cultivated fall into two groups; the one consisting of luscious green and purple canes of local or foreign origin, the other the hard Uba of Natal. There are fields of Uba on the Zambesi from which twelve or more ratoons per plant have been taken. It is probable, however, that on the rich, alluvial plains heavy canes will oust the Uba, which is essentially a dry-land cane.

* * * *

Delagoa Whale-Fishing Law.

The *Government Gazette* of Lisbon which arrived by the mail contains the provisions of the new law relating to whale-fishing in the Portuguese Colonies. The provisions generally are strongly protective, and the following are the main points in the law:—Licences will only be issued in respect of Mozambique ships. The number of licences to be issued in respect of Angola and Mozambique will be limited to those already in force, until the number that can possibly be issued can be determined according to the estimated available number of whales in Colonial waters. The killing of young whales is prohibited under a penalty, for the first offence, of £50. The present concessions in the hands of foreigners will only be renewed after their expiry in so far as there is reciprocity with the respective countries. Each foreign firm engaged in the whaling industry will pay annually: For each steamer employed, £100; each sailing vessel, £60; each small whaling tug, £38; each pair of small whaling boats, £4; for each square metre of ground used, 1d.; for every square metre of the total surface used by floating factories, 5d. All nationals will be exempt from these payments. A tax of 5 per cent. *ad valorem* will be levied on all oil and whalebone exported when such is sent to foreign ports; when sent to national ports, a tax of 2½ per cent. only. On ambergris exported the respective duties will be 20 and 10 per cent. respectively. All fertilisers manufactured from whales shall be exported free of duty to Portuguese territories, but if sent to foreign countries will have to pay a duty of 3 per cent. Municipalities cannot impose a tax on whales caught in Portuguese waters exceeding 4s. for each whale. All material required for the prosecution of the whaling industry shall be admitted duty free.

New Ranching Companies in Rhodesia.

Several important ranching companies have recently been established in Rhodesia. Among these, the British South Africa Co., at Rhodesdale, Liebig's Extract of Meat Company at West Nicholson, the Rhodesia Cattle and Land Company, Ltd., at Gwanda, Messrs. Chambers and Plant at Ndanga, the Makorsi River Ranching Co. at Victoria, the Anglo-French Co. near Gwelo, the Matabeleland Ranching Co. near Selukwe, and De Beers Consolidated Mines, Ltd., at Shangani, are embarking upon operations on a large scale.

* * * *

Natal Wattle Bark for United States.

In order to try to develop a market in the United States for Natal wattle bark, an association composed of the principal wattle growers in the Province has just completed arrangements for forwarding 500 tons to certain American tanners for experimental purposes. At present the wattle bark output of Natal goes chiefly to Hamburg, which fixes the price of the product. The producers believe that there is an agreement among the Hamburg buyers which tends to lower the price, and it is for this reason that they are most anxious to find another market which will compete with the German. The price of wattle bark has declined very much within the past two years. The average in Durban, f.o.b., January 1, 1912, was about £5 10s. per ton, compared with a little under £5 per ton on January 1, 1913. Since January the price has further declined, and producers are somewhat depressed over the outlook for the future. The total output of bark in the Province in 1912 was about 52,000 tons. It is estimated that it will reach 70,000 tons during 1913. During the next five years, with the area now planted, the output should reach 100,000 tons per annum. If present prices continue, however, there will almost surely be a decline in production after the growing trees have matured.

* * * *

Union Banking Figures.

The simultaneous publication of the banks' statements in the *Union Gazette* now makes it possible to compare the principal figures at the close of the half-year with those of former dates. The present position will be made clear by the following table:—

Half-year ended	Total deposits.	Advances.	Coin Reserves.
June 30, 1912 ...	£33,725,000	£30,942,000	£6,500,000
Dec. 31, 1912 ...	35,891,000	31.842,700	6,773,000
June 30, 1912 ...	36,138,100	32,597,300	6,596.500

The percentage of advances to deposits, which was reduced from 91 to 89 between June and December of last year, has again gone up to 90. The advances and coin reserves exceed deposits at the present time by £3,055,500, which compares with £2,721,000 last December, and with £3.717,000 a year ago. With the exception of coin reserves all the figures have reached a level never hitherto attained on a corresponding date. The proportion of fixed to total deposits remains about the same as that recorded six months ago, namely, 42 per cent. The advances, which have risen continuously since the middle of 1909, can hardly be expected to rise any further in the near future, in view of the local loan issue and of the unsettled industrial atmosphere. The total advances inside the Union, together with those of all offices outside the Union, amount to 43½ millions, which is a substantial increase on the figures at the close of December last. The total deposits, £45,400,000, have not appreciably altered during the half-year. As an indication of the effect which the development of the gold industry has had directly on banking, it is interesting to note that in the course of 21 years the Transvaal bank assets have increased by 234 per cent., which compares with increases of 118 per cent. and 104 per cent. by the Natal and Cape banks respectively.

Automobile Notes.

In the first four months of the current year the imports of motor cars and motor bicycles to the Union amounted in value to £365,388, which is more than double the value of the imports in the corresponding period of 1912. More than half of the imports were entered through Port Elizabeth.

* * * *

Apropos of the Government's intention to adopt motor transport in certain country districts, the following questions were lately addressed to the Minister of Railways and Harbours in the House of Assembly: (1) What is the estimated cost per mile of instituting and operating a road motor transport service for passenger and goods traffic as specified in the Report of the General Manager of Railways for 1911, with particulars as to cost of (a) preparing the necessary roads, (b) supplying the vehicles, (c) the equipment of the service, and (d) maintaining the same; and (2) what has been the actual average cost per mile of the road motor transport services at present in existence in the Union? The Minister of Railways and Harbours replied: (1) Estimated cost per mile of instituting a road motor transport service for passenger and goods traffic: Where good roads are in existence, £250 per mile; where first-class metalled roads have to be constructed, £1,450 per mile; where second-class roads have to be constructed, £900. Estimated average operating costs: Passenger service, 1s. 7d. per car mile; goods service, 6d. per ton mile. (a) Estimated cost of preparing necessary roads: First-class metalled road with maximum grade of 1 in 15, £1,200 per mile; second-class road made from local gravel or road metal with maximum grade of 1 in 12, or existing veld road graded and hardened, £650 per mile. (b) Estimated cost of vehicles: First-class passenger vehicle, to carry passengers, mails, and parcels, £1,100 per vehicle; 3-ton baggage or goods lorry, £825; paraffin tractor with trailers carrying 12-ton load, £1,600. (c) Estimated cost of buildings, plant, machinery and tools, exclusive of vehicles: 20-mile service, £680; 30-mile service, £1,100; 40-mile service, £1,500. (d) Estimated cost of maintaining roads, plant, and equipment: Roads, £30 per mile per annum; vehicles (including depreciation), 9d. per car mile; equipment, 7½ per cent. per annum on original cost. (2) Average actual cost of existing services, including depreciation, 1s. 7·7d. per car mile.

* * * *

The Select Committee on motor traffic recommends, *inter alia*, the establishment of a new traffic branch of the Board of Trade, and the bestowal on County Councils of drastic powers for the regulation and closer control by the police. The omnibus companies of London have already protested against the unfairness of handing over the regulation of the business to the County Councils, who are rivals as tramway owners. The report gives figures showing remarkable transformation in traffic. In London, in 1907, there were 3,700 power and 12,700 horse vehicles. In 1912 there were 13,800 power and 2,800 horse vehicles, without reckoning commercial vehicles. The yearly journeys of passengers are two thousands millions, increasing at the rate of a quarter of a million daily. Street fatalities were 537, compared with 155 in 1904. The accidents were twenty thousand, compared with ten thousand.

* * * *

The subject of fuel for motor vehicles has been considered this week by the Imperial Motor Transport Conference, now being held in London. The first paper read was one on "Petrol Substitutes," by Sir Boverton Redwood and Prof. Vivian B. Lewes, in which they enumerated the only likely sources from which a substitute for petrol might be derived as being:— (1) Those portions of crude petroleum other than the petrol fraction; (2) Products of the destructive distillation of coal and shale; and (3) Products of fermentation.

* * * *

The deepest impression made upon the visitor to the Commercial Motor Show open at Olympia, London, W., in mail week, is the extent to which, in so very short a space of time, the commercial motor vehicle has entered into the business life of to-day. The exhibits at the show cover a wide range of loads, and it is possible to obtain vehicles of carrying capacity, ranging through about twenty grades, from three hundredweight up to six tons, while, in addition, there are heavy tractors, ambulances, fire engines and tenders, and for municipal purposes road-watering machines, sweepers and lorries.

* * * *

The comfort of the man of moderate means has been carefully catered for in the passenger vehicles. The taxicab and char-a-banc are luxuriously fitted and upholstered, and ample protection against inclement weather is provided.

* * * *

The certainty of the change which is slowly, if surely, taking place in the attitude of the public towards the motorist is reflected in the circular which has now been issued by

CONTINENTAL

TYRES.

Reduction in Price,

But no Reduction in Quality.

Ask your Garage for New Price List.

the Home Secretary to the police authorities in England, recommending police traps only on roads where high speed is really dangerous. The recommendation, if rightly interpreted by the police, should direct their vigilance to the suppression of driving to the public danger. This is as it should be, and the Government is to be congratulated on the sensible step they have taken towards the removal of so deplorable a blot on the British police system, as has hitherto existed in the establishment of traps on straight, open stretches of road.

* * * *

The mission which the *Motor* has set itself—the encouragement of the production of benzole as an alternative fuel to petrol—has already met with the most encouraging success. It has checked the further advance in the price of petrol, which the oil magnates, with brutal frankness a few months ago, stated it was their intention to impose. The output of the home-made product is steadily increasing, and the motorist in England who desires to use it has now no difficulty in finding depots where it may be obtained. When the *Motor* first started on its campaign it was not able to publish more than half a dozen addresses of dealers in this product. To-day the list fills five closely-packed columns of that enterprising journal.

* * * *

Benzole has now been used in aviation. On the occasion of His Majesty's recent visit to Lancashire, a local aviator, Mr. Melly, hovered over the scene of the inspection of the mercantile fleet in an aeroplane driven by this spirit.

* * * *

An expert driver is not necessarily a good driver. In the many motor car accidents that occur it is surprising at the first blush how few novices are concerned. But it is only the first impression that surprises the inquirer. The apparent paradox yields to examination, and the reasons soon become clear. The novice is far too careful to take any risks, and it is in the taking of risks that the chief causes of disaster lurk. I am not referring here to the rarer class of accident which may overtake the most careful driver—the breaking of an axle or stearing gear, or the oft-times unhappy consequence of a burst tyre, or even perhaps the failure of a brake—but to traffic accidents in crowded thoroughfares.

* * * *

It is here where the expert driver finds the greatest temptation to take risks, and amongst the most expert is the driver who plies for hire. It is his business to get as many fares as possible, and in order to accomplish this he must get ahead of his rivals. Speed, daring and dexterity, are his chief weapons, and he who uses them the most skilfully wins in the race for the dollars—so he argues, and success confirms him in his argument.

* * * *

In the long run, however, he must come to grief, for success invariably breeds over-confidence, and there are elements which he can never properly appreciate. These are, the degree of skill possessed by the other man—with whom sooner or later he is bound to meet in the tight corner—and the different point of view. Each may do what to his judgment is the right thing, and each might be right if the point of view were the same, but that is where the difficulty comes in and the accident happens—the error in judgment.

* * * *

A good driver must be expert, though he need not be brilliant, but he must also possess imagination. He must not depend entirely upon his skill to avoid accidents when they already appear imminent. He must foresee the possibility of accident and take precautions to avoid it. To do this, his mind must be occupied, not only with the road in front of him, but with all the surrounding conditions, actual and probable. The conditions of traffic actually in view, the probability of converging traffic from side roads, and the carelessness of the ordinary pedestrian, and always he must be prepared for the error of judgment on the part of the other man, and hold in hand the necessary margin for safety.

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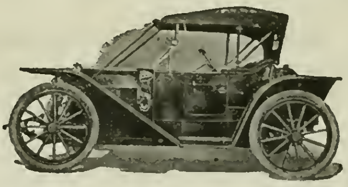

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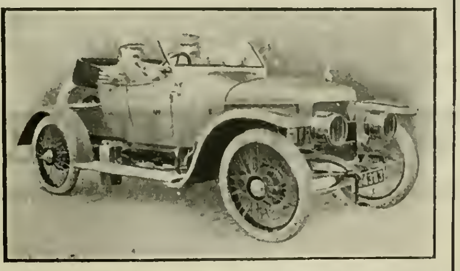

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QUARTERLY REPORTS.

Crown Mines, Ltd.

The following is the report of the Crown Mines, Ltd., on the operations for the quarter ended 30th June: —Revenue, £861,518, or £1 9s. 6d. per ton from 579,100 tons crushed; cost, £488.998, or 16s. 11d. per ton; profit, £372.520, or 12s. 10d. per ton; development work, 10,304 feet. Assay values:—Main Reef Leader: Distance exposed, 2.710 feet; width, 28 inches; assay value, 57s. 8d. South Reef: Distance exposed, 1,550 feet; width, 40 inches; assay value, 43s. 1d. Total yield, 204,598 fine ounces. The tonnage crushed amounted to 579.100 tons, an increase as compared with the previous quarter of 18,100 tons, and the percentage of waste rock sorted increased by over 1 per cent. During the half-year 975,110 tons of ore were developed, and valued at 31s. 6d. per ton, of which 922,282 tons (or 95 per cent.) were payable, and valued at 32s. 9d. per ton. The expenditure on capital account during the quarter amounted to £15,980 9s. 10d., and an amount of £182,101 remains unspent in respect of authorised capital expenditure; this includes provision for the sinking of a circular shaft for ventilation purposes. Towards the end of June the opinion was expressed by men who had been a long time in the service of the company that the employees as a whole were entirely against striking in sympathy with the men who had ceased work at Kleinfontein and on the Eastern Rand. On July 4 the majority of the underground men, although wishing to work, decided not to go underground, for fear of being posted as scabs and receiving personal injury. During the morning a crowd of some 600 strikers from Johannesburg visited No. 1 shaft, and returned to town. The fitters, turners and firemen, on the instructions of their unions, came out about 11 o'clock. At mid-day, as it was rumoured that another crowd was coming to the property, and in the absence of any protection, it was decided to close down all the mills, which were not restarted until midnight on July 7. Work under normal conditions was resumed on Wednesday, July 9, and throughout the whole period of unrest no damage to property was done. A force of 150 special constables enrolled from the company's employees afforded some measure of protection to the property, which covers a very large area. No trouble was experienced with the natives, although the presence of such a large number of unwillingly unemployed men was a source of great anxiety. The native labour position is, however, very serious. Labourers whose contracts have expired are not re-engaging, and the Government has for the time being prohibited further recruiting. At March 31 there were 15,291 native labourers; at June 30 this was reduced to 13,434; and at July 20 a further wastage of 663 had occurred. In view of this position and of the additional cost and loss of revenue brought about by the strike, shareholders must be prepared for a temporary decrease in profits. An interim dividend (No. 24) of 55 per cent. was declared for the half-year ended June 30.

Bantjes Consolidated Mines.

The following is the report on operations at the Bantjes for the quarter ended June 30:—Revenue, £108,436, or £1 4s. 6d. per ton, from 88,400 tons crushed; cost, £96.820, or £1 1s. 10d. per ton; profit, £11.616, or 2s. 8d. per ton; development work, 6,270 feet. Assay values:—Main Reef Leader: Distance exposed, 720 feet; width, 17 inches; assay value, 47s. South Reef: Distance exposed, 2,905 feet; width, 9 inches; assay value, 111s. 8d. Total yield, 25,838 ozs. Payable ore developed in last six months: Leader, 3.900 tons, value £1 5s. 3d.; South Reef, 49,300 tons, value £1 9s. In addition to the above tonnage fully developed, there was exposed by driving a further considerable tonnage of indicated payable ore, but which is not yet fully developed and valued. The development accomplished for the quarter, namely, 6,270 feet, again shows improvement, being 659 feet in excess of that of the previous quarter. At the 6th main concentrating level animal traction has been introduced, and after several slight improvements have been made to the ore pass at the west shaft the full benefit of its introduction will be obtained. Good progress has been made with the 10th main concentrating level, and the western section of this drive is now being driven on Leader and is exposing payable values. The South Reef disclosures for the quarter are slightly lower than those of the previous one, but the values exposed in the lower levels on this reef remain satisfactory. The exposures on Leader show improvement, but payable ore is only being exposed in a few areas. The development suspense account now shows a credit of £20,308, being an increase of £795 for the quarter, in spite of the increase in development footage accomplished. Connection on the 7th level between the east and central shafts has recently been made, and arrangements are in hand to transfer the east shaft water to the main pumps installed on the 10th level at the central shaft. The working costs show the large reduction of 1s. 3d. per ton, there also being an increase of 5,750 tons in the tonnage milled. The profits, however, on account of the reduced yield of 3s. 6d. per ton at £11.616, are £8,582 lower than those of the previous quarter. There was a sudden drop in the grade in April, and this has been traced in a measure to the concentration of values in the fines, due to the liberal use of water in the workings for dust-allaying purposes. Every effort has been made to recover a proper proportion of these fines with the coarse rock without too much sacrifice of efficiency in the labourers employed. The average grade to date for the month of July is much higher again, and is at the moment about equal to the average call from the ore reserves. Several breakdowns of the winder at the central shaft occurred during the period, which somewhat hampered development operations, but it is hoped that the repairs effected will ensure smooth running until the new hoisting engine, which is now being erected, is placed in commission. The net capital expenditure for the quarter amounted to £3,470 12s. 2d. on the hoisting engine, and the amount yet to be expended on this authorised vote is £10,974 8s. 2d. The unrest which existed amongst white employees of mines on the East Rand during the latter portion of May and June had a disconcerting effect upon this company's European employees, who felt, however, that the strike should be confined to the Benoni district, where it originated. Both underground and surface men stated that they had no grievances, but that in the absence of adequate protection it would be impossible for them to remain at work if a general strike were called. On the morning of July 3 all underground employees gave 24 hours' notice of their intention to cease work on the 4th; the surface men remained at work on the 3rd until ordered out by a representative of the strikers, who stated that they would be "pulled out" by workmen on strike at Roodepoort unless they ceased work. Pumpmen and men engaged on the reduction works did not participate in the strike, and continued at work throughout the whole period of unrest. The battery restarted work at 1.30 a.m. on the 8th, having been stopped for 3 days 17 hours. All employees had returned to work by the 10th July. No damage was done to the property of the company, which was guarded during the suspension of work by a force of special constables recruited from the employees. No trouble has been experienced with native employees, but the labour position as regards this class of labour is considerably worse than at the close of the first quarter of the year. On March 31 we had 3,400 natives in our service; this number was reduced to 3,112 at June 30, and during the first 20 days of July a further wastage of 320 has taken place. Further recruiting has been stopped for the time being by the Government, and time-expired natives are not renewing their contracts. In view of the position, the general unsettled state of affairs, and the additional expenditure entailed thereby, the past rate of profits cannot be expected until more normal conditions prevail. An interim dividend (No. 3) of 5 per cent. was declared on June 26 for the half-year ended June 30.

At the last meeting of the Kroonstad Town Council, the Mayor read an important letter from the Secretary to the Minister of Mines, stating that the Voorspoed Diamond Mines had now been transferred to De Beers, Ltd., and that instructions had been given by the Government that the mine must be worked at once.

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Notes and News.

The Position To-day.

Quiet has now succeeded the restless times of last month on the Reef. The Secretary for Mines has taken up his residence in Johannesburg and is engaged in daily interviews with Labour leaders and mine managers, with a view to "implementing" the concessions granted to the men. The *personnel* of the Economic Commission is likely to be announced at any moment. One of its terms of reference is said to be the definition of the spheres of white and coloured labour. Meanwhile the weekly system of wage-paying is being generally introduced along the Reef, and the new regulations dealing with the reduction of working hours are being framed. The restriction of employment consequent on the shrinkage of native labour is the only bad feature of the situation. On the West Rand, operations have been curtailed at the West Rand Consolidated, and the Champ d'Or has been shut down, mainly, however, for financial reasons. Opinions differ as to whether the position may have to be worse before it can become better.

* * * *

Zeerust Lead and Zinc.

Splendid progress is being made at the Zeerust lead and zinc mines, now under the control of the T. C. L., Ltd. A reduction plant has been ordered, and a considerable addition to the Transvaal's contribution to the world's supply of those metals may be expected. Ore is said to be developed considerably ahead of the contemplated productive capacity of the plant.

* * * *

African Farms' Tin.

Excellent reports are to hand regarding the tin properties controlled by African Farms, Ltd. The ten-stamp mill at Welgevonden has been running merrily for some weeks, with highly satisfactory results. At Leeuwpoort, the mill is ready to start up, and it would have been at work before this, had there not been delay in delivering the two Nissen stamps which are included in the reduction plant. The official opening of the mill will take place in a few days, and the occasion will, doubtless, be a red-letter day in the district. It is probable that the Administrator will perform the opening ceremony.

* * * *

Mechanically Operated Shaking Shute.

In one or two mines of the Central Rand a considerable saving in "lashing" boys is being effected by imparting a swing to shaking shutes through employment of a hammer drill. The machine is operated at a slow stroke and each stroke of the piston gives the hanging trough a sharp swing, thereby causing the rock to gravitate down to boxholes. We witnessed one such mechanically operated shute at work in a large stope in a deep level mine during the week, and we were informed that a saving of six boys was being effected through substitution of mechanical means for hand labour. In these times of labour shortage the idea, it would seem, might be profitably extended along the Reef.

* * * *

The Village Deep.

The Village Deep, in common with most mines on the Witwatersrand, is suffering severely from native labour shortage. Indeed, the mine has at present about 1,500 boys below the normal complement, and whilst the full mill is at work the stamps are crushing a restricted tonnage. Underground an active development policy continues to be pursued and the twenty-first level has just been reached. The twentieth level is to be equipped as a main haulage level.

* * * *

The Witwatersrand Commercial Exchange.

At the annual meeting of the Commercial Exchange this week, the retiring Chairman, Mr. R. H. Philpot, regretted that he was not in a position to congratulate all on having had, by any means, a record year, at any rate as far as turnover and profits were concerned. He pointed out that the recent unfortunate dispute had made things very much worse. Competition also during the past year had been very keen, there being many lines now sold which did not carry a sufficient margin of profit to pay working expenses. This was largely due to merchants being overstocked, and to the "grasping policy" adopted by many firms. A question now often asked is, how far the existence of the Exchange is responsible for the prevailing over-competition in Rand trade. The institution, of course, was brought into being at the behest of the leading Rand mercantile firms, and they have suffered as much as anyone else from the increased competition. The benefits conferred upon the mining and commercial community by the Exchange are admittedly many and important. The question is whether it has not accentuated the evils of over-competition. Considerable economies have been rendered possible to both mine buyers and merchants by the organization; and it may not be surprising that this has been offset by the cutting of prices. There is, at any rate, something radically wrong with Rand trade if it makes so poor a showing in a year that has seen no less than £18,923,765 distributed in mine wages, and £12,660,047 in mine machinery and stores. If the 189 firms who are members of the Exchange cannot make fair profits out of the business going through, the matter ought to be investigated. Commissions appear to be again in favour, and it might be advisable to appoint a joint committee of the Commercial Exchange and the Chamber of Commerce to enquire into the effect upon trade of existing methods of conducting business on the Rand.

* * * *

Uitkyk Collieries New Issue.

With reference to the issue of 75,000 8 per cent. Cumulative Convertible Preference Shares of £1 each, of which 20,000 shares were specially reserved for South Africa, we are informed by the secretary that the remaining 55,000 were duly subscribed for and issued in London. The subscription lists for the South African allotment of 20,000 shares close to-day. Applications may be sent through any branch of the Standard Bank, where the prospectus can be seen.

* * * *

Our Oil Prospects.

Mr. Cunningham Craig has left this country after an examination of most of the "likely" oil-bearing districts.. His investigations had to be cut short owing to his having to fulfil an important engagement in Canada. Mr. Craig made no secret of the fact that he did not attach much importance to any of the indications of oil brought to his notice. He seemed more favourably impressed with the oil-shale deposits, however, and it is in that direction he sees most hope of South Africa building up an oil industry. Capital and favourable conditions are, of course, necessary to enable the extensive oil-shale deposits of this country to realise their possibilities; and the former will doubtless be forthcoming, should Mr. Craig's considered report confirm his *obiter dicta* in this regard. It is interesting to note Mr. Craig's view that no one locality inspected by him possessed all the essential indications of oil. There were places that showed some of those essentials; other revealed other necessary signs, but in no one place were all the indispensable indications combined. Despite his warnings, however, several syndicates are continuing their prospecting operations. Their promoters cheerfully point to the fact that South Africa is the grave of reputations and they look forward to burying that of the latest oil expert, where he says they will bury their money, viz., at the bottom of their deepest borehole.

* * * *

Blasting by Electricity.

Further electric blasting tests have been carried out in the Meyer and Charlton mine during the past week, and results are stated to continue satisfactory. We understand that the shots in question were fired from the shaft station and the further progress of this work will undoubtedly be followed with keen interest. Whilst a considerable amount of good may result from the firing of holes by electrical means in certain mines or in certain working places it would, we think, be a mistake to expect any very revolutionary improvement. In some mines, where a single shift is worked, the conditions are such that most of the men can get back to the shaft and surface without suffering any ill effects through contamination of the atmosphere as a result of blasting. The view is held, too, by some practical men that there would be a tendency for a greater number of holes to explode within a very short period of time throughout a mine than under the more usual conditions on the Rand of firing by means of a "cheesa" stick. This, it is feared, might have as a consequence the weakening and disruption of the hanging wall which again would probably augment the number of accidents caused by falls of ground. A further point that requires investigation is whether there would not be greater liability to lose count of holes fired by electric exploders than under the more general method in vogue, and thus create a tendency towards more accidents through missfires. The whole subject is, we believe, now being given the most thoughtful attention by the members of the Miners' Phthisis Prevention Committee. Undoubtedly electric blasting has advantages in shaft sinking and under certain circumstances in development, but whether the benefits accruing are sufficient to justify wholesale application to all branches of mining work right along the Reef remains to be seen.

* * * *

The Unfortunate Giant.

Drilling operations at the Giant Mines property, near Gadzema, in Mashonaland, have been temporarily suspended whilst the sinking of the new shaft proceeds. The Giant appears to have more than its due share of misfortunes. The output for July was: 30 stamps and 2 tube mills ran 26·2 days; 10,122 tons—2,270 ozs. fine. Estimated value, £9,631. Estimated profit, £3,500. The reduced tonnage and profit are due to considerable trouble in ore passes during the month of July, being outcome of previous caving in of stopes. It is anticipated that results for August will be better.

* * * *

Rand Collieries Closing Down.

We are officially informed that owing to the impossibility of obtaining further working capital at the present moment, the Board of Directors of the Rand Collieries, Ltd., have decided to shut down the mine for the time being. The announcement, of course, was not unexpected, in view of the restricted scale on which operations at the mine have recently been carried on, and the present depressed state of the money market.

* * * *

A Half-Year's Diamonds.

The diamond production for the Union for the six months was:—Transvaal: 1,081,995·01 carats, value £1.482.510, of which 49,278·76 carats, value £273,685, were won from alluvial diggings and miscellaneous. Cape Colony: 1,250,775 carats, value £3,635,282, of which 56,152·25 carats, value £386,611, came from diggings other than the Kimberley mines. Orange Free State: 273,560·32 carats, value £839,834. The total production for the Union for the half-year was 2,606,330·33 carats, value £5.957,626.

* * * *

Rand Wages.

Mr. Kotze's statistics in the annual report for 1912 show that in December of last year there were 11,037 miners and underground labourers receiving an average pay of 20s. 3d. per shift, and 9,332 surface men getting 16s. 10d. per shift. The average pay for the combined labour was 18s. 9d. per shift, while the average yearly earnings per white labourer were £316. The statistics seem to show that though the average rate was slightly lower than in the previous year, it was higher than in 1910 or 1909, but lower than in 1907. If, however, comparisons be made with the rates of pay ruling twenty years ago, it appears that the present scale is considerably higher. Messrs. Hatch and Chalmers' standard work on the gold mines shows that skilled miners were paid in 1894 from 14s. to 15s. per shift, rock-drillmen £1 per shift, fitters 15s. to 20s. a shift, and so forth. It will hardly be questioned that the cost of living on the Rand has fallen substantially since 1891, yet if these rates be compared with the rates paid to-day, it will be seen that there has been an advance, and not a decline, in the wages paid.

* * * *

Improvement of Miners' Surroundings.

The United States Bureau of Mines is about to investigate the conditions under which a miner works, believing that the unsanitary conditions which exist in some of the mines, as well as in some of the mining towns, are a factor in the death rate among the men. It is intimated that these conditions not only unnecessarily cause the death of miners through disease, but they are often responsible for accidents which might not have happened if the miners were in perfect health. The Bureau has organized what is known as the Mine Sanitation Section, in charge of J. H. White, engineer, and hopes to bring about progress by appealing to the miner, the manager, and the owner, showing that all three can assist, and be benefited by good sanitary conditions. It will reach the miner by means of illustrated lectures, moving picture exhibits, and pictorial circulars. These will show how sickness and suffering are spread by careless habits, and will drive home the importance of personal and household cleanliness.

* * * *

Amalgamated Properties.

The scheme of reconstruction unanimously passed at the extraordinary general meeting of the Amalgamated Properties of Rhodesia on July 14 has been duly confirmed. This marks the commencement of a new era in the history of the enterprise, and it is believed that the proper and intelligent development of its valuable interests will lead to the new company being successful. Happily the differences with Sir Abe Bailey, which threatened to involve the company in prolonged and expensive litigation, have now been settled, and Mr. Bonnard was able to announce at the meeting that Sir Abe Bailey has carried out the promise he gave to the shareholders on July 14 and has taken up the two blocks of shares in dispute. The only outstanding matter is the question of the £100,000 loan, and this is now the subject of arbitration. There can be no doubt, judging from the attitude of both sides, that complete justice will be done in the arbitration. "We want," Mr. Bonnard says, "nothing more than the recognition and carrying out of our moral and legal rights."

* * * *

Willoughby's Subsidiaries.

The satisfactory report recently issued by Willoughby's Consolidated shows that with regard to the subsidiary companies, the Eileen Alannah mine is expected to reach the producing stage in the early part of next year, and in this connection it is interesting to learn that its ore reserves are five years ahead of the mill. Tenders for the latter are now being called for. At the Connemara the ore reserves are now estimated at 179,384 tons, of a value of £279,540, with an additional 70,000 tons of probable ore. On the northern extension great lengths of reef exist, showing promising values still awaiting development. Metallurgical experiments are now being made under Mr. Marriott to determine the best method of treatment of the ore and the erection of a plant capable of treating 6,000 tons per month has been recommended. Owing to the great width of the lodes and the favourable situation of the mine, within three miles of Salisbury-Gwelo section of the main railway, the working costs are estimated at a very low figure, and are not likely to exceed 15s. per ton. The outlook may, therefore, be considered promising. Operations at the Matabele Queen's mine were much hampered during several months by shortage of water. An additional supply has recently been installed, sufficient to meet all requirements. During a run of 313 days 16,517 tons were crushed and 19,396 tons of current and accumulated sands and slimes treated for a total recovery of £37,913, the working profit for the year being £9,329. At the commencement of the year the ore reserves stood at 21,310 tons, of an average assay value of 51s. 3d. per ton, and at the end of the year they showed at 31,680 tons, of an average value of 43s. 5d. per ton.

TOPICS OF THE WEEK.

THE FAILURE OF THE MINERS' TRAINING SCHOOL.

Perusal of the annual report of the Chairman of the Government Miners' Training School on the Wolhuter engenders a feeling of keen disappointment. The school, up to the present, is obviously a failure, as may be seen from the extracts from the report printed elsewhere in this issue. Notwithstanding the efforts of the esteemed chairman, Mr. Moses, and his colleagues on the Board of Control, together with the staff, the school has not achieved the object for which it was brought into existence. It will be remembered that some years ago when the scarcity of miners first began to be felt the idea of a training school for the purpose of teaching the youth of the country the art of mining was mooted and met with strong support from the mining houses and the Government. It was hoped that a scheme could be devised which would attract the surplus young men from all parts of South Africa and convert them into intelligent miners with the ability to earn good remuneration. It is true that the South African born miner is steadily increasing in number, which is a matter for congratulation, but unfortunately he is not passing through the training school, and not having had the preliminary training requisite to make a good miner he is not the class of worker calculated to materially benefit either himself or the industry. It is, in a sense, too easy for a man to get work underground on the Rand, and so long as this state of affairs obtains it will be difficult for the training school to make much headway. The mines are in need of underground workers, and provided a man is sufficiently robust, has plenty of assurance, and has managed to secure a blasting certificate, he stands a good chance of being engaged at full pay. Few questions are asked when men are needed. Under these circumstances, one can quite understand the reluctance of well developed youths to bind themselves apprentice for a number of years at the small wage offered; they prefer either to get on the mines directly or to follow some other remunerative occupation for a few years and then go underground on full pay after a few months' probation. To talk to these youths of the advantages they might ultimately derive from a thorough training is, in most cases, quite useless. The only thing which appeals to them is the wage they are offered, and they are quite content to let the future look after itself. The idea of the Government Mining Engineer accepting the three years' apprenticeship as qualification to sit for the mine overseer's certificate will possibly appeal to some. Mining is very humdrum work, especially for youngsters. We are pleased to note the provision of evening classes within the precincts of the school, but whilst such subjects as arithmetic, etc., are naturally essential we think it would be well, in view of the characteristics of the students, to go beyond this and try and arouse a little enthusiasm. To arouse enthusiasm in mining is no easy matter, but nevertheless the subject can be shown in attractive form, and the achievement of Professor Yates can be recalled two or three years ago when night after night his lectures on mining at the College crowded the lecture theatre to overflowing, his enthusiasm infecting his audience and holding them absorbed and interested. A man who raised the number of students at the College from ten to four hundred might possibly give the Wolhuter school the much-needed stimulus in the direction of success. It appears to us that enthusiasm is the note that must be struck if the school is to make headway, and it might be suggested to the Committee that they approach engineers like Professor Yates with a view to arranging series of lectures which whilst being instructive will raise the subject out of the rut of deadly dullness and so interest the apprentices in their work. The provision and training of our future underground workers is a matter of the greatest importance to the Union of South Africa, and every effort should be made to carry the training school through to a successful issue.

THE OUTLOOK IN RHODESIA.

Affairs in Southern Rhodesia in regard to mining appear to be improving somewhat and there are sound reasons for believing that there will be further progress in the near, if not in the immediate, future. The recently published reports of several Rhodesian mining companies, and notably those under the control of the Gold Fields Rhodesian Development Company, indicate that the basis of production in the country will be substantially enlarged next year. It is true that in a number of cases operations last year were not altogether successful, but notwithstanding difficulties in the way of finance, arrangements have been made which will enable four or five new and promising mines to enter the productive list within the next few months. There are two particularly gratifying—one might almost write refreshing—points to be observed in connection with these new producers. In the first place development has been pushed ahead to such an extent that the mines in question will commence productive operations under very much more sound and promising conditions than have generally prevailed in Rhodesia in the past. The Shamva is now possessed of ore reserves totalling over two and a quarter million tons, the Cam and Motor has over a million tons blocked out, whilst at the other "new" mines a thoroughly consistent development policy has been religiously adhered to. In the second place plants have been ordered with due regard to the characteristics of the ores it is proposed to treat. In the past numerous mines in Matabeleland and Mashonaland not only commenced milling with insufficient ore reserves; they also began crushing with plant quite unsuited to the ore. Nowadays wiser counsels prevail, and in a number of instances no orders for permanent milling and treatment installations have been given out until preliminary testing plant has indicated an effective and economical method of gold recovery. For these reasons one is safe in presuming that the two big new mines of the country, the Shamva and the Cam and Motor, will make their productive *débuts* under most favourable conditions, whilst it is furthermore assured that the Antelope, Bell, Eileen Alannah, Golden Kopje, and Falcon Mines will not give rise to any of the unfortunate fiascos that have not been rare occurrences in the history of Rhodesian mining. As to the older propositions of the country—that is to say, mines that have been crushing for some time past—the position generally is fairly satisfactory. The Globe and Phoenix continues to hold easily pride of place as the leading productive and profit earning mine of the country, and despite the unfortunate notoriety this concern has earned in the Home Press in regard to administration it must be admitted that the mine itself is in a sound position. At the Eldorado it has been found necessary to reduce the monthly profit—for the time being, at any rate—but the latest developments appear to be particularly good. The Giant has been in the doldrums for a good while past on account of stratigraphical disturbances in the lower levels of the mine. The Lonely, on the other hand, continues to earn highly satisfactory profits, and having regard to the ore reserves and the general outlook underground this proposition may certainly be accounted one of the best mines of Matabeleland. The four properties cited may be regarded as fairly representative of the fluctuating fortunes of the more important mineral propositions of Rhodesia. As to the small mine element little or no abatement of activity in this direction is noticeable. Whilst some of the more familiar of the miniature mines have dropped out of the productive list, fresh names continually are being added, and it is particularly encouraging to note that not a few 5 and 10 stamp batteries which were yielding very profitable monthly clean-ups half a dozen years ago continue to record excellent outputs. We cite the Csardas in the Selukwe district as a case in point. In minerals other than gold much activity exists at present, and whilst this may perhaps be regarded as a passing phase only of Rhodesian mining it must be acknowledged that the present operations, particularly those of the Wankie Colliery and the Selukwe Chrome Iron Mines, are satisfactory enough. Altogether, then, there seem to be ample grounds for believing that the present outlook for mining in the territory of the Chartered Company is much brighter than was the case when we last took stock of the position eight or nine months ago. There is no justification for a boom—it is to be doubted if there ever has been—but unless there is a serious shortage in native labour supplies or a further repetition of questionable methods of finance there should be an early and substantial expansion in the mineral industry of Southern Rhodesia.

THE FIGHT AGAINST MALARIA. ✓

That excellent body, the Anti-Malaria Association, continues to wage successful war on the harmful, unnecessary mosquito. Many of the mines in the "outside" districts of the Transvaal, Natal and Rhodesia have still to reckon with malaria as one of the inevitable risks of mining, and to them the work of the Association is of direct economic value. Reports received by the Association go to show that malaria has been more than usually severe this year, especially in the Northern Transvaal. In view of the comparatively small rainfall experienced during the past season, it is difficult to account for this increase, except on the theory, suggested by one of the medical members on the Council, of a "flock migration" of anopheline mosquitoes. A noteworthy feature has been the peculiarity of distribution, some places having entirely escaped, while in others almost everyone has been incapacitated. Again, it is reported that cases of malaria have been found on the mountains overlooking the low veld, at altitudes higher than former experience has led one to expect to find them. These circumstances combine to show the need for systematic investigation as to the distribution and movements of mosquitoes. The report points out that an encouraging feature is to be found in the fact that wherever the precautions urged by the Association have been observed the disease has been successfully kept at bay. Thus, at Rooiberg Tin Mine, in the Waterberg district of the Transvaal, a property which formerly had the reputation of being very malarious, and at which for the last three years a vigorous anti-mosquito campaign has been carried out, not one new case of malaria has occurred during the year. Relapses from former attacks are of course excluded. Outside the area of the anti-mosquito operations, however, mosquitoes have been abundant and malaria, in consequence, has been very severe. Invaluable educational work is being done by the Association. Its publications continue to be widely distributed. By the co-operation of several departments of Government copies of a wall-card issued by the Association, dealing with the danger of mosquitoes, have been hung up at all schools, post offices, railway stations, and other public offices within, or on the outskirts of, malarial districts. By this means the educational work of the Association has been brought very prominently to notice, and to the children the Association looks particularly for carrying on its work. Direct postal distribution of literature to farmers and others resident in country districts has also been undertaken, and is being continued in all districts, whether served by local branches of the Association or not. From inquiries which have been made as to the result of the Association's educational campaign abundant testimony has been received as to its having had a great influence among the better educated section of the community. The same, it appears, cannot be said of the less educated classes, who are prone to treat the information supplied with scepticism. An interesting fact in connection with the introduction of the larvae-eating fish, "Millions," imported from the West Indies, emerges from the report. It has been found that these are preyed upon by some unknown natural enemy, and they have disappeared from the rivers in which they were placed. At Stellenbosch, however, some have been retained, and it is possible that the experiment may still turn out successful. The work of the Association is obviously of enormous importance to the future of a great part of the country and should command not only the support and sympathy of the Government, but the co-operation of all intelligent men.

THE LOT OF THE RAND MINE WORKER.

A Special Enquiry into the Conditions of Life and Work along the Reef.

III.—ARE UNDERGROUND HEALTH CONDITIONS IMPROVING? INTERVIEWS WITH THE MEN.

In the two preceding articles of this series we have dealt with the sums of money paid to workers along the Reef for various branches of work and with the conditions under which employees live above ground on a typical Central Rand deeper level. The enquiries so far instituted very clearly establish the facts that (a) the men are well paid, and (b) that the social and generally living conditions on the mines are good. We submit that, taking into consideration the rates of wages, the cost of living on the mines, and the nature of the accommodation, food, benefits and recreative facilities provided for workers the employee on the Witwatersrand is better off than on any other mining field in the world. This view is, we think generally shared by the workers themselves and the public at large. But as against this, the argument is often used that the unhealthy conditions obtaining on the mines offset the high pay and the general excellence of above ground living. In other words, it is contended that the prevalence of phthisis and a comparatively high accident rate are such dangers to life and limb that wages higher than those that can be earned on other fields and better above ground living conditions than those obtaining in other parts of the world are only fair recompense. In fact, it is often alleged that the miner's health is so much endangered by underground work that the pay is insufficient. It is admitted—and there are few dissentients to the view—that in average mining field circumstances the rate of pay of the Rand would, having regard to surface living conditions, be notably high. We have then to institute some special enquiry into this vital subject of underground working conditions in the mines in order to obtain a proper perspective of the circumstances of the Main Reef miner. A tremendous amount has recently been written on the subject of miners' phthisis, accidents in mines, and the general conditions of underground work. Our own columns have contained copious extracts from reports, evidence before Commissions and other authoritative documents. We have, too, from time to time chronicled the measures adopted for fighting the dust evil and improving both the quality and quantity of the mine air. At the outset it may be stated that it is recognised that conditions in the mines in the past were bad; in some mines very bad. It will be of little benefit to make this investigation retrospective. The point to be determined is whether matters underground are improving or whether they are not improving. It is common knowledge that recently reliable authorities have testified that there is marked improvement. Some have gone so far as to bear witness that miners' phthisis is well on the way to total elimination, and that to-day the mines of the Witwatersrand, in points of sanitation, air, and dust allaying, etc., compare more than favourably with the mining propositions of other fields. But as the majority of these witnesses occupy high and responsible positions their opinions are regarded as being prejudiced and unreliable. With the accuracy or otherwise of this view of the value of evidence we are not here concerned. Neither is it proposed to dissect and analyse the statements of certain political detractors who have consistently sought to vilify the whole fabric of Rand mining, no matter what their actual knowledge of the facts they speak of may be.

A VISIT TO THE VILLAGE DEEP.

We decided that the best course to adopt was to witness miners at their work underground and to ask the man on the spot, the man behind the handle of a machine drill, what his opinions and experiences were. With this object in view, a representative of this paper visited the Village Deep mine during the week. Permission to institute personal and independent enquiries underground was readily granted. The Village Deep, which embraces the Turf Mines, includes some of the deepest workings on the Rand. There are three shafts, and in the Government Mining Engineer's report for last year the ventilation conditions are described as follows:—Vertical depth of shallowest and deepest workings, 1924—4,215 feet. Temperature, 60 degrees to 70 degrees Fahr. Wollaston's sprays are used behind developers and in main travelling ways. The water-pipe is led into the air-pipe near the drive or winze face. Before blasting, the air and water taps are opened. The blast is very effective.

SOME REPRESENTATIVE OPINIONS.

On arrival underground we first met Messrs. H. and M. On being asked, the former stated that he had knowledge of the Village Deep mine extending over a number of years, and he was most emphatic in his opinions as to the improvements in regard to air, dust allaying, etc., that had taken place during that period. "There is as much difference between conditions now and conditions then," he said, "as there is between Heaven and Hell. A few years ago this was a bad mine. Men used to come up with their faces obscured, almost unrecognisable, by dust. I myself often well-nigh fainted away underground." Our informant is a fine, strong, well-built specimen of manhood, and we realised from the emphatic manner in which he spoke that in the past mining in a Rand deeper level was work that must have taxed the resources of the most lusty. "To-day," he continued, "there is abundant water throughout the mine, and it is seen, too, that this water is used. No man can truthfully state that he has not ample water. If any man can prove that through lack of water for the face he is compelled to cease work in accordance with the Government regulations, which require that ample water shall be employed in all drives, stopes, winzes, etc., the mine will pay the man's wages all the same, work or no work." "Do you think that electric blasting would improve underground working conditions?" we asked. "I am not at all sure that it would. You must not forget that were electric blasting adopted throughout the mine there would be a greater proportion of shots going off almost together than under the present system." "Even with time fuses?" "Yes. I think that the tendency would be to weaken the hanging and cause a greater number of accidents through falls of ground. There would be a greater shock or concussion at blasting time underground, and that might have a bad effect on the roof." "You regard the air as good in the deepest workings of this property?" "Yes, I do. The air currents are very powerful. But, mind you, I do not say that all mines on the Rand are as well ventilated and equipped with appliances for dust allaying as this mine." Mr. M., who has had considerable experience on the East Rand as well as in the Village Deep, concurred in the opinion that conditions had greatly improved.

THE MINER'S VIEW.

The next man we met was Mr. W., a north-country man and a machine drill contractor. "Do you think conditions are improving underground in regard to dust allaying and ventilation generally?" we asked. "In this mine, yes. I have not had sufficient experience of other mines recently to say whether that is true of the Reef generally." "Suppose I started mining here to-morrow. Assume I am in good health and condition. How long do you think I could work here without contracting phthisis?" our representative asked. "It is very hard to say. [illegible] depends on the life a man leads above ground. [illegible] who is working down there below me is an athlete. He goes for very long walks every day, and he should last for a good number of years. We are not all athletes, but exercise and the life one leads above ground mean a great deal." "If I took all reasonable precautions below ground and led a sane and healthy life at surface, do you think I should live for more than seven years if I took to mining here?" "Yes, I do," replied Mr. W. "How much longer?" "Well, it is hard to say; perhaps twice as long." "You consider I ought to last for 14 years?" "Yes, provided you took care of yourself." "And at the end of 14 years you think my health would begin to suffer?" "Yes." "From phthisis?" "From the general conditions of underground work." "What do you regard as the principal cause of discontent along the Reef to-day?" "Well—the money earned." "But don't men earn large wages on the whole?" "They have to take on risks to earn big money. See my stope up there. If I was paid a bigger price I could afford to be more careful. A few years ago £8,000 profit per month was considered good enough for this mine. Now they expect £20,000 or more." "And how has this extra profit been secured? Has the grade of ore improved?" "I don't think so." It was suggested that the pushing ahead of development, more native labour, and better organisation of the native labour force had been contributory factors. Mr. W. acquiesced. We returned to the point. "Do you think the increased profit has been won by 'speeding men up' and getting them to take unnecessary risks Would any mine captain or shift boss here ask you to unnecessarily risk life or limb to increase tonnage?" "No." "And do you think the average miner on the Reef to-day is as good a workman as the average man of a few years ago?" "No, I don't think the average man to-day is so good." "What has happened to the good miners then?" "Most of them have died of phthisis or been scared away. There are few good miners from the North of England or Cornwall coming to the Rand to-day. Phthisis has frightened them away, and it is going to take a long time for confidence to be regained."

We thanked Mr. W. for his information and then proceeded to interview other workers. With their views we propose to deal next week.

Recent Rand Metallurgical Patents.

As bearing on the question of metallurgical ingenuity and enterprise on the Witwatersrand, it is interesting to note that our American contemporary, the *Mining and Scientific Press* of San Francisco, in the issue to hand by last mail, deals with recent metallurgical patents on the Witwatersrand. Certain critics of the Western States of America have recently taken the Rand somewhat severely to task in regard to metallurgical practice and the adoption of the most modern and approved methods. In consequence mention of the three patents dealt with hereunder in a Pacific Coast technical journal is worthy of notice. The patents in question are as under:—

REGULATING UNDERFLOW FROM CONE SAND CLASSIFIERS.

The application of Charles William Dowsett is for the purpose of providing automatic means for regulating the underflow from cone sand classifiers. An outlet valve at the underflow aperture is made to open when the frictional engagement of the moving sand overbalances a weighted level which again comes into operation to close such valve when the sand is below a predetermined level so that the vertical surface supplied for the frictional engagement presents a smaller area of contact.

REGULATING UNDERFLOW OF CLASSIFYING CONES.

The application of William Arthur Caldecott refers to the means for regulating automatically the underflow of a classifying cone or similar apparatus, the main part consisting of a buoyant body or float which actuates a valve or equivalent device placed at or near the outlet of the cone, the said body of float falling or rising according to the depth of settled solids increases or decreases inside the cone and thus automatically opening or closing the outlet. This apparatus is used in combination or otherwise with the diaphragm forming the subject matter of patent No. 231 of 1908.

TUBE-MILL DISCHARGE.

The application of William Calder has reference to the discharge of ground pulp from tube-mills and consists of a perforated plate through which the pulp enters a lift chamber having means, such as radial arms, to elevate the pulp and discharge it into the discharge trunnion of the mill. Its usefulness lies in the free and rapid discharge of comminuted ore from the mill, giving the effect of a peripheral

In Liquidation.

The Wonder Mine, Ltd., the Dolly Boy Syndicate, and the Pretoria Premier G.M., Ltd., are in liquidation.

The Diamond Fields.

July Diamond Returns.

The detailed diamond returns for the month of July are to hand, and show a total of 7,735 carats, value £39,843 11s. Though the carats have only been exceeded by those in March and May months, the total value is the smallest of any month this year, pointing to the complaints that reduced prices having some truth in them. Forty localities figure in the July returns, and summarised these are as follows:—

	Carats.	Value.		
Bloemhof	1,540½	£7,784	16	6
Eerstebegin	884¼	4,810	7	6
Koppiesvlei	1,045½	4,741	7	6
London	784½	3,689	12	6
Eastleigh	474½	3,306	9	6
Rietput	502¼	2,740	15	0
Avondster	463¾	2,320	0	0
Dievedraai	364½	1,562	7	6
Kameelknil	229¾	1,321	0	0
Mooifontein	248¼	1,192	0	0
Zwartlaagte	138	786	17	6
Goedgenoeg	136¾	764	5	0
Palfontein	177½	704	10	0
Christiana	83	551	2	6
Biesjeslaagte	66	538	10	0
Olievenhoutfontein	97	503	0	0
Maroetjesfontein	91¼	436	17	6
Diamantdoorns	63¾	444	15	0
Schaapboschdraai	83¾	282	5	0
Johannesrust	39	221	0	0
Zevenfontein	33¼	189	15	0
Schweizer Reneke	23	158	0	0
Kuilfontein	33½	140	5	0
Honeyskop	18½	115	0	0
Vuurfontein	19¾	105	10	0
Rondevlei	11¼	81	0	0
Kromellenboog	14¼	74	5	0
Doornbult	13¾	53	0	0
Kalkfontein	8	46	7	6
Modderkraal	11	42	0	0
Weltevreden	6	33	5	0
Vaalpoort	3¾	33	0	0
Kareepan	5½	19	10	0
Amsterdam	5	15	0	0
Matlabanstad	4½	15	0	0
Koppiesfontein	1¼	8	0	0
Middlebosch	3¼	6	0	0
Koksrust	2	3	10	0
Vanaswegensrust	1¼	2	0	0
Mamusa	½	1	5	0

Sheba and Rosetta.

The following are the results of the working of the Sheba and Rosetta Mines for the month of July, 1913:—Sheba: Mill ran 28 days, crushing 6,500 tons, yielding 3,238 ozs. of fine gold; estimated profit, £1,435. Rosetta: Mill ran 12 days, crushing 716 tons, yielding 179 ozs. of fine gold.

TWO NEW MILLS FOR THE FURTHER EAST RAND.

Government Areas and Modder Deep Installations Another Million Tons per Annum Involved Position and Prospects of the State Mines.

Recent events have tended to deflect public interest from the further East Rand, the development of which constituted the most important and interesting feature of the Main Reef Series prior to the strike. Industrial unrest and shortage of native labour have caused attention to be concentrated on a broader aspect of the mining industry than the opening up of one particular section of the Main Reef Series, but at the same time it must not be overlooked that in the vast eastern annexe of the Witwatersrand, despite the upheaval of two months ago, and the depression that has followed in its train, events of prime importance have taken place lately, and despite adverse labour and financial conditions there has been distinct progress towards that goal of achievement which is to mark the consummation of the numerous ambitious prospects of the further East Rand area.

Important Events.

In the last couple of months the Van Ryn Deep has commenced crushing, and the south shaft of the Springs Mines Company has encountered the reef. The Geduld Proprietary has got its new plant to work, and at Brakpan there has been a change for the better in the development results secured. As to the older and more established mines like the New Modder, Modder B and Van Ryn, operations, when allowances have been made for the disorganisation resulting from the strike, have been very successful both as regards development and productive operations.

The latest information available as to the further East Rand is particularly important and gratifying in that it concerns the extension of crushing operations at two new mines. In the head engineering offices of the Johannesburg Consolidated Investment Company and A. Goerz and Company, plans and specifications for the early equipment of the Government Mining Areas on Modderfontein and the Modderfontein Deep Level mine are now being considered. It is not at this juncture practicable to state exactly and in detail the design of the two installations, but it goes without saying that each will be as modern, efficient and economical as money and engineering and metallurgical talent can make them. It may be of interest to note that each mill will be of ordinary high duty gravitation stamps.

The State Mines Equipment.

The Government Areas battery will in the first place have a capacity of 50,000 tons per month and it is expected that a plant will be operating on this basis of crushing before the end of the year. Having regard to the enormous mining area controlled by the company, the equipment will naturally be laid out with a view to expansion. The second stage in the milling scheme will be attained when plant of 100,000 tons per month capacity is installed, but beyond this there will be further extension, to what limit it is impossible at this early stage in the history of the company to say. Everything, however, indicates that in a few years' time the Government Areas property on Modderfontein will be capable of supplying a much larger equipment than that tentatively agreed on as the second stage in the milling scheme, and of keeping such an installation at work for a considerable number of years.

Extension to a very considerable degree—if not indeed almost indefinite extension—has then to be borne in mind by the engineering department of the House of Barnato as a primary consideration in connection with the planning of any milling projects for the Modderfontein State Mines. Were it not for this, it is probable that the new Modderfontein Areas installation would be almost a duplicate of the new battery and treatment plant installed on the Consolidated Langlaagte, and the equipment of the Van Ryn Deep, which commenced crushing operations a few weeks ago. These plants may be regarded as representative of the last word in mill and cyanide plant construction on the Main Reef series.

The Modderfontein Government Areas installation is likely to be similar in design to that erected at the Van Ryn Deep, but the stamp battery will differ in one important particular from both the Consolidated Langlaagte and Van Ryn Deep mills in that it will be a back to back equipment, whereas the stamps at Langlaagte and the Van Ryn Deep are arranged on the single row principle. There will thus, too, be a different arrangement for delivery of mill pulp to the tube mills. A battery of back to back pattern naturally adapts itself to extension more readily than a single cam shaft equipment, and this, as already stated, has had to be a dominant consideration in regard to the Modderfontein property. It has been decided to erect the plant close to the south-east shaft. The temporary offices and workshops are located there and the situation generally accommodates itself to concentration of work around this point. The shafts will all be connected up by railway lines and locomotives will transport ore to the mill.

It is impossible at this juncture to venture anything approaching reliable predictions as to the average grade of ore likely to be milled by the company. In this as in every other mine poor zones as well as rich sections are only to be expected, but with an average "payable" recovery throughout the greater part of the mine and a certain amount of rich ore such as was intersected at the south-west shaft to "sweeten up" this average, the Government Gold Mining Areas should secure quite satisfactory profits. The company has the lease as from November, 1909, of the exclusive right to mine precious metals upon certain two mining portions of the farm Modderfontein No. 167, and the extent of the area is 2,633 claims. The extent of the mineralised area of the property may be the better realised when it is stated that the distance around its boundaries amounts to no less than ten miles. In the northern shafts the average dip of the reefs indicated by work done to date is in the neighbourhood of 14 degrees. In the south-east shaft the reef lies much flatter and it appears likely that there is a considerable flattening tendency. More work will, of course, have to be done before the average dip throughout the mine can be approximately determined. It may here, however, be stated that at an average dip of 11 degrees the 2,633 claims, on a basis of not more than three feet of reef, would, after a 10 per cent. reduction for faults and broken ground, represent nearly forty million tons of ore.

Modder Deep.

A circular printed elsewhere in this issue gives details of the mill for the Modder Deep. These two new mills, it will be seen, represent a total crushing capacity of just under a million tons per annum, and at both properties there will be further extension, having regard to the large mining areas of the properties in question. The commencement of construction operations at these two mines will mark a further step towards that day when the combined milling plants of the further East Rand will be producing almost double as much gold as at present.

Jumpers-cum-Treasury.

The following cable was despatched to the Jumpers Company's London agents on Saturday :—"Clean-up completed; joint profit, £3,498; balance joint gold reserve, nil."

Mines Department Exams.

Private Individual Tuition for Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine-Drivers' Examinations. Practical Mathematics and Electrotechnics. Correspondence Lessons where personal tuition is impossible. E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings, corner of Eloff and Pritchard Streets, Box 2061, Johannesburg

DEVELOPING THE MODDER DEEP LEVELS.

Details of Mining and Milling Plans—Position and Prospects Described—Water and Ventilation Questions.

The excellent progress recently made in the opening up of the Modder Deep Levels has caused the directors to decide upon the erection of a reduction plant at once. The appended circular, issued this week, gives details of the financial position of the company and of the proposed issue of capital to defray the cost of plant. The latter, it is understood, will consist of 70 stamps and 6 tube mills, and will embrace all the standard features of the most modern Rand mills, such as filter presses, etc. Development has been rapidly carried on, from three levels, which will be increased to five, and the mine thus opened up on the bold lines originally planned. The yield will, doubtless, approximate to the figure given in the circular, as sorting will balance the mine assay factor. With the reef dipping at from 7 to 8 degrees, the values maintained at the figure given in the circular, and the cost at, say, the same figure as Brakpan, it is easy to estimate the profit possibilities of the property. Though Brakpan works on a much larger scale, there is no reason to suppose that Modder Deep Levels costs will be higher. Taking all factors into consideration a life of at least 20 years can be counted upon, and with the capital brought up to £500,000 at September 30, 1914, by the issue of the remaining 105,500 shares at 35s. per share, one can figure out the prospects for oneself.

Ventilation and Water.

Provision is being made for the thorough ventilation of the mine by artificial aids, and of course an ample supply of water has been laid on to all working faces, so that the mine should be thoroughly healthy. In regard to water, it is satisfactory to learn that the supply has now been reduced to below half a million gallons per day.

The circular to shareholders of this company states that in April, 1910, an amount of £557,500 was provided in order to put the company in a position to sink two shafts to the reef, and do sufficient development work to enable the question of the erection of a mill to be decided upon. Steady progress has been made in carrying out this programme. The shafts cut the reef body in August and October last respectively, and since then development work has been actively continued. The work done has not completely blocked out ore as yet, but it is estimated that 750,000 payable tons of partially developed or probable ore have been disclosed in blocks in which development work is progressing. The value of the development footage done in the blocks referred to is 31s. 9d. over 70 inches stoping width. All indications also point to the probability of good working conditions, particularly favourable features being the good width of the ore body and the existence of the profitable ore in large compact bodies. There is every reason, therefore, to anticipate a satisfactory profit. The board has consequently decided on the immediate erection of a mill to crush 30,000 tons per month, with which it is hoped to start production about the end of next year. It is expected that by the arrangements detailed below the sums necessary for this purpose, and to continue development work pending the commencement of crushing, will be provided as they are required. The present issued capital is £263,000, in £1 shares, and by the articles of association the directors are empowered from time to time by resolution to increase the capital of the company by the creation of new £1 shares of such amount as they may deem expedient until the nominal capital shall have been increased to £500,000, and to allot, issue, and deal with such shares as they may think fit. The directors have entered into an agreement with A. Goerz and Co., Ltd., under which that company guarantees the subscription of an issue to the shareholders of this company of 131,500 new shares at 30s. per share. As consideration A. Goerz and Co., Ltd., received a commission of 2s. 6d. per share on the 131,500 shares guaranteed by them, and the option to subscribe at 35s. per share until September 30, 1914, for 105,500 further shares. In accordance with the above, the 131,500 new shares are now offered to the shareholders at the price of 30s. per share, in the proportion of one new share for every two shares registered in their names at the close of business to-day. Fractions of a new share will be disregarded. Shareholders are at liberty to apply, if they so wish, for less than their proportion. The price of 30s. per share is payable as follows: 15s. per share on acceptance (being 10s. on account of premium and 5s. on account of capital), and 15s. per share on or before October 15 next (being the remaining 15s. on account of capital). Shareholders have the right of paying in full on acceptance, or at any time before October 15, but no discount will be allowed. Failure to pay the instalment due on October 15 next will render the shares taken and the previous payment liable to forfeiture.

THE GOVERNMENT MINERS' TRAINING SCHOOL.

Points from First Annual Report—A Very Qualified Success.

Mr. W. Moses, Chairman of the Government Miners' Training School, in his annual report, states, *inter alia*:—"I have the honour to submit the first annual report on the school, covering a period of 15th July, 1911, to the end of 1912. The school having been in existence for nearly eighteen months at the end of 1912, it is possible to review the results achieved during that period and to form some idea of its scope and utility in the future. The first intention of the Government in establishing the school was to provide an opening for the youth of the poor white class, so many of whom are settled in the industrial centres. It was quickly found, however, that the scheme would not answer this purpose. This class of youth did not come forward, and the Inspector of White Labour, who personally canvassed the poorer suburbs, failed to arouse any enthusiasm among the very class for whose benefit the scheme was instituted. Our experience gained from the few who did join shows that far greater disciplinary powers would have to be possessed by the school before they could be made into reliable miners. We have had therefore to depend on a more limited class for recruits to the ranks of skilled miners. Considering the advantages of the scheme and opportunities offered for learning a lucrative trade, the response has been most disappointing, as at the end of 1912 only forty-six apprentices were in residence, and only once, for a short period, has the school attained to its full complement of fifty. The reasons for this failure has had the serious attention of the Board, and they may be formulated as follows:—(a) The miners' phthisis scare; (b) dislike of hard work; (c) impatience of control and of the indenture period of three years. The first cause is deep rooted and will only be overcome by time and representations as to the healthier conditions now obtaining underground. The second will only succumb to educative disciplinary measures, and the third will remain as long as semi-skilled miners can earn good wages. The greatest difficulty has been experienced in convincing the apprentices that the whole trade of a skilled miner cannot be learned in nine months. Since the opening of the school 107 apprentices have signed their debentures. This number is disposed of as follows:—Resigned at the end of three months' probation, 26; resigned voluntarily to better position, 8; resigned as medically unfit, 7; dismissed for misconduct or as unsatisfactory, 20; still in residence, 46; total, 107. In reviewing the work of the school since its commencement, then, it cannot be said that so far it has been a success or otherwise. The following facts are against it: Lack of support; failure to balance revenue and expenditure. For it, it may be said that a number of youths who otherwise would have little chance of rising in the world are afforded an opportunity to do so. The so-called learner on a mine is rarely afforded an opportunity of learning anything, and remains a 10s. a day man on tramming or waste packing. The school, therefore, is the only means by which the poorer, uneducated class of youth can get on and the somewhat thin ranks of South African born skilled miners can be augmented. The system worked on seems satisfactory and has the merit of being easy of expansion, and in this respect the school may be said to be a success. What remains, therefore, is to use every endeavour to attract applicants and to show less cost to the Government, and these problems will have the close attention of the Board.

ELECTRICAL APPARATUS IN METALLIFEROUS MINES.

Important Regulations Regarding Electrical Blasting, Lighting and Power Transmission.

WITH a view to promoting safety, economy and efficiency in the methods of installing and operating underground electrical equipment in metal mines, a report embodying a number of rules to be observed has been prepared and issued by the American Mining Congress Committee appointed to deal with the subject. It is intended to follow with this report the same course followed by the Committee on the Standardisation of Electrical Equipment in Coal Mines, whose report after the receipt of many suggestions was amended, and in its amended form has been adopted by the Legislature of Pennsylvania as a part of the State Law. The rules as formulated are as follows:—

DEFINITIONS.

The expression "pressure" means the difference of electrical potential between any two electrical conductors.

1. *Low Pressure.*—Where the conditions of the system are such that the pressure between any two conductors, or between any conductor and the earth, at the terminals where the electricity is being used cannot exceed 300 volts, this shall be deemed a low pressure system.

2. *Medium Pressure.*—Where the conditions of the system are such that the pressure between any two conductors, or between any conductor and the earth, at the terminals where the electricity is being used, can exceed 300 volts but cannot exceed 600 volts, this shall be deemed a medium pressure system.

3. *High Pressure.*—Where the conditions of the system are such that the pressure between any two conductors, or between any conductor and the earth, at the terminals where the electricity is being used, can exceed 600 volts, this shall be deemed a high-pressure system.

DISTRIBUTION SYSTEM.

Rule 1. *Switching Station.*—Where the generating station or substation is more than 500 feet from the entrance to the tunnel or shaft, a switching station shall be installed at the entrance to the tunnel or shaft for cutting off the power from each circuit.

Rule 2. *Hoist.*—The circuit feeding electric hoists used for raising or lowering men shall be separate from all other circuits, and shall run from the distribution centre, and no other electrical apparatus shall be connected thereto.

Rule 3. *Lightning Arresters.*—Where the circuits entering the shaft house or tunnel are from an overhead transmission system, each circuit shall be protected by lightning arresters, which shall be grounded to efficient grounds prepared for that purpose.

Rule 4. *Grounding.*—All alternating-current systems in which the normal working pressure does not exceed the limits of medium pressure, and all three-wire direct-current systems shall be grounded. In alternating-current power systems where the voltage does not exceed medium pressure and where the secondaries of the transformers are connected in star, then the neutral or centre of the star shall be grounded. Where the distribution system is delta or open delta, then the central point of one transformer shall be grounded. Where the distribution is three-wire direct current, then the neutral shall be grounded. The wiring for signal or telephone circuits shall be placed on the opposite side of the man-way, shaft or tunnel, from the power or light wiring.

Rule 5. *Underwriters.*—All wiring shall conform to the rules of the National Board of Underwriters.

Rule 6. *Shaft Wiring.*—All power wires whose pressure does not exceed medium pressure shall be run where possible in the man-way or the compartments of the shaft where hoisting does not occur, and shall be either lead-armoured cable, or run in water-proofed or drained conduit. If the lead-armoured cable is used the insulation must be non-hydroscopic and as acid-proof as possible. The cable shall be held in place by frequent fastenings spaced according to the weight of the cable so that the cable is firmly and securely held in place and there is no danger of the cable "dragging." The lead covering of the cable must be grounded. If the wires are run in conduit, junction boxes shall be placed at every level, and in no case shall the interval between boxes exceed 150 feet. These junction boxes shall be held in place and provision made to hold the weight of the wire in the conduit leading to the junction box below, on insulated supports. The iron conduit must be grounded.

Rule 7. *Power Wires.*—All power wires whose pressure exceeds that of medium pressure shall be of either lead-armoured cable or incased in iron or steel conduit or other approved non-hydroscopic conduit; in any case metal covering shall be well grounded with wire at least one-half the size of the largest wire in the cable or conduit.

Rule 8. *Joints.*—All joints must be electrically efficient, mechanically strong, and soldered unless approved solderless joints are used. All joints except in trolley wires should be taped or otherwise suitably insulated to protect them from corrosion.

Rule 9. *Bushings.*—Where unarmoured cables or wires pass through metal frames or into boxes or motor casings, the holes shall be substantially bushed with insulating collars.

Rule 10. *Sectionalising.*—Wherever branch electric circuits leave a main or secondary feeder, cut-outs and switches shall be provided for disconnecting the branch line from the supply line, and all main and distributing feeders shall be provided with sectionalising switches at distances not exceeding one mile. All cut-outs above ground to be in approved metal cabinets and under ground in subway-type cabinets.

Rule 11.—*Switches, Circuit-Breakers, Fuses.*—All switches, circuit-breakers and fuses must have bases of marble, slate or porcelain, or other suitable incombustible non-hydroscopic material, free from metallic veins, and shall be placed in as dry a situation as practicable.

Rule 12. *Circuit-Breakers, Fuses.*—Fuses and automatic circuit-breakers should be so constructed or adjusted as to open the circuit when the current through them exceeds not more than 100 per cent. of the working current in the case of motors, or by not more than 30 per cent. of the permissible current of the cables which they protect. Fuses shall be stamped or marked, or shall have a label attached indicating the current at which they are intended to fuse. Fuses shall be adjusted or replaced only by a competent person, authorised by the mine superintendent.

Rule 13. *Grounds.*—The rails of the haulage system and the air and water pipes shall be connected together wherever practicable so that the efficiency of the "ground" may be bettered, and where the formation is such that good electrical grounds cannot be obtained, then the tracks, and air and water pipes, shall be connected to a good and well-prepared ground at the mouth of the tunnel or collar of the shaft, as the case may be.

APPARATUS.

Rule 14. *Sizes and Capacity.*—All electrical apparatus shall be sufficient in size and capacity for the work it may be called upon to do, and so installed, operated, maintained and safeguarded as to reduce the danger from accidental shock or fire or overheating to the minimum, and shall be of such construction and so operated that the rise in temperature caused by ordinary working will not injure the insulating material.

Rule 15. *Grounding.*—All electrical apparatus—that is, motors, transformers, generators, and their switching devices—installed underground, shall have their frames well grounded.

Rule 16. *Portable Motors.*—A higher pressure than medium pressure shall not be used for portable motors.

Rule 17. *Transformers.*—Where pressure higher than medium pressure is used in connection with transformers installed underground, they shall be installed in a dry, well-ventilated, fireproof room or compartment or station so arranged that it can be entirely closed with fireproof doors should any accident occur, and the fire arising from the accident be smothered.

Rule 18. *High-Pressure Motors.*—No motors of less than 15 h.p. shall be used on circuits of higher than medium pressure.

Rule 19. *Switches and Fuses.*—All motors, together with their starting resistance or induction starter, as the case may be, shall be protected by fuses and switches or by automatic circuit-breakers capable of entirely cutting off the current, and these must be in sight of the motor.

Rule 20. *Trailing Cable.*—In the event of the trailing or portable cable in service breaking down or being damaged, or of its inflicting a shock upon any person, it shall at once be put out of service, and shall not be used again until it has been repaired and tested by the mine electrician or his assistant.

ELECTRICIANS.

Rule 21. *Employment of Mine Electricians.*—At every mine where electricity is used below ground, a competent mine electrician and, where necessary, an assistant mine electrician also, shall be employed, subject to the authority of the mine superintendent. The electrician shall have full charge of all electrician apparatus used in connection with the mine. Every person appointed to operate any electrical apparatus in connection with a mine shall be instructed in his duty by the mine superintendent or electrician before taking charge of the apparatus.

Rule 22. *Inspection of Wiring.*—It shall be the duty of the mine electrician to inspect all wiring and apparatus once every ten days, and once each month to make report of such inspections in writing to the superintendent, stating all defects found and how repaired.

PROTECTION.

Rule 23. *Fire Buckets.*—Fire buckets filled with clean, dry sand shall be kept where stationary electrical apparatus is located, ready for immediate use, and regularly inspected once every month. The provisions of tetra-chloride fire extinguishers is recommended.

Rule 24. *Resuscitation.*—Instructions shall be placed at the mine entrance, and in every generating, transforming, and motor house, for the resuscitation of persons suffering from electric shock. All employees operating the electrical apparatus shall be required to acquaint themselves with these instructions.

Rule 25. *Recording Accidents.*—Every personal accident occurring in connection with the operation of the electrical equipment shall be promptly reported by the person injured, or by some other person on his behalf, to the mine superintendent, and shall be recorded by him at the office of the mine.

Rule 26. *Plans.*—A plan on a scale not smaller than 200 feet to the inch shall be kept at the mine, showing the position of all permanent electrical machinery and fixed cables or conductors in the mine, and shall be corrected as often as may be necessary to keep it as nearly as practicable up to date, and never more than six months in arrears.

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HAULAGE.

Rule 27. *Location of Wires in Roadway.*—In underground roads the trolley wires shall be placed as close to the side and as straight as practicable, and securely supported at frequent intervals. In all roads where it is necessary for men to travel on foot, all wires, except signal wires, must be placed on the same side of the roadway. The trolley wire shall not be less than 6 feet from the top of the rail unless protected from casual contact of passers-by by suitable shield or trough.

Rule 28. *Protection of Cables.*—Where the cables in main haulage roads, where persons are hauled into or out of the mines, cannot be kept at least 18 inches from any part of the car, they shall be specially protected. Cables and wires, unless provided with metallic coverings, shall not be fixed to walls or timbers by means of non-insulating fastenings. Where main or other roads are being repaired, or where blasting is being done, temporary protection must be used so that the cables are protected from damage.

LIGHTING AND SIGNAL WIRES.

Rule 29. *Erection of Lighting and Signal Wires.*—Small wires for lighting or signal circuits shall either be conveyed in pipes or casings, or they may be suspended from porcelain or glass insulators or securely tied to them, so that they do not touch any timbering, rock or metal. On no account shall staples be used. If metallic pipes are used they must be grounded and well drained. If separate unincased wires are used, they shall be kept at least 3 inches apart, and not brought together except at lamps or fittings.

BLASTING.

Rule 30. *Shot-firing.*—Electricity from light and power circuits shall not be used for firing shots in a mine except where the electrical connection to such light or power circuit is made within an enclosed switch room, which shall be kept securely locked and shall be accessible only to the authorised shot-firer. If electricity from light or power cables is used for firing shots in a mine, no shots shall be fired until all the men are out of danger. Special precautions must be taken to prevent accidental contact between shot-firing cables or wires and power and lighting cables. Only persons authorised in writing by the mine foreman or superintendent are permitted to fire shots electrically in a mine.

Rule 31. *Battery or Magneto Exploders.*—Where battery or magneto exploders are used, they shall be inclosed in a suitably constructed box, fitted with a removable connecting plug or key, without which the circuit cannot be closed. This plug or key shall be detached when not required for firing, and shall not under any conditions pass from the personal custody of the shot-firer while on duty. Exploders shall be frequently tested by the shot-firer to insure that they give the necessary pressure and current. The exploder shall not be connected to the shot-firing cable until all other steps preparatory to the firing of the shot have been completed and all persons have removed to a place of safety. Immediately after the firing of the shot the firing cable shall be disconnected from the exploder, and no person shall approach a shot that has been attempted to be fired by electricity, and has failed to explode, until the firing cable has been disconnected and interval of five minutes has elapsed since the last attempt to fire the shot.

TELEPHONES.

Rule 32. *Telephone Systems, When Required, How Installed.*—All mines from which exit is by shaft only, and all others in which the working places extend more than one mile from a place of exit, shall be provided with an underground telephone system, provided the number of underground employees at any one time on the regular working force exceeds 25. The system shall be of approved construction, and of such extent that no working place shall be at a greater distance than three-fourths mile from a telephone; principal shaft stations shall be provided with telephones. All main telephone cables shall be insulated with waterproof insulation, and unless run through metal pipes or casings, or approved conduit, they shall be protected by a contiuous lead sheath.

PRESENT POSITION OF TRANSVAAL TIN MINES.

Authoritative Account of the Prospects of Some of the Lesser Properties.

In the course of his annual report, Mr. T. G. Trevor, Inspector of Mines, Pretoria District, writes:—

Solomon's Temple and Groenfontein.—At Solomon's Temple and Groenfontein the developments have been entirely unsatisfactory, the old pipes remaining barren though driven on for long distances, and nothing new of any permanence having been encountered.

Groenvlei and Appingendam.—At these places and the surrounding farms nothing fresh has occurred, and though tin continues to be discovered at or near the surface, I do not think there is one case in which it has continued to 50 feet in depth. At Groenvlei a shaft has been sunk 200 feet deep on a group of fissures which all show tin on the surface. In the fissure sunk on, tin continued for about 40 feet; a few crystals were met with at about 190 feet, but otherwise the reef below 50 feet was barren. A crosscut is now being put in to intersect the other fissures, but nothing has so far been struck in it.

Welgevonden and Doornhoek.—I am informed that there has been a distinct improvement in depth. At the former of these mines a battery is now under erection, and production will soon commence.

Century Tin.—At Rhenosterhoekspruit the Century Tin Mine is for the time being shut down. A small mine which may or may not be payable, but which certainly has good prospects, was developed, but the means of the company being exhausted, they are now waiting for more capital before going further or erecting a plant.

Rooiberg Mine.—The new plant is working excellently, and the output has risen to over 100 tons of concentrates per month, at which figure it is believed it can be kept for at least two years. In the main mine the developments in actual depth do not appear to be more than merely satisfactory, but the developments on the surface extension are excellent, so much so as to lead one to the conclusion that the future of this mine is well assured for years to come, even if the values below 200 feet should prove disappointing.

Leeuwpoort Mine.—Developments are excellent; there are five separate areas, each of which may be considered a favourable 5-stamp proposition. A central mill has been erected, and an output of over 100 tons of concentrates per month is anticipated, and I believe will be realised.

Weynek Mines.—The two mines on Weynek are both shut down permanently, as the values entirely disappeared with depth. There are, however, a certain number of tons of tin in sight on the T.C.L. property which will repay extraction, and sooner or later this mine will be reopened for the purpose of recovering them. The same thing is true of a great many unsuccessful tin propositions, and sooner or later what in the aggregate will be a large number of tons of concentrates may be extracted from various properties which have been abandoned as failures. In the same way the Rhodesian gold output is largely derived by tributors from mines which have been abandoned by their original companies.

Olifants River Tin Fields.—A large number of farms have now been prospected along Olifants River from the junction of the Elaods River to that of the Galumpies River. Cassiterite has been found on many of the farms, but the chief occurrences are at Stavoren, Mutua Fides, and Tygerpad; the latter two of these are adjoining, but the first is some ten miles to the south-west.

Stavoren.—At Stavoren the occurrences remind one of the Government area at Zaaiplaats; the tin occurs along fissures not merely incrustated on a wall, as at Appingendam, but in irregular masses of thoroughly decomposed granite of a similar character to the pipe-filling of Zaaiplaats. Up to date nothing that can be called permanent has been found, but the tin extracted appears more than sufficient to cover the cost of the work.

Mutua Fides and Tygerpad.—At the Mutua Fides and Tygerpad a somewhat similar description to that of Stavoren applies, but the tin assumes a rather more pipe-like form, and is not so obviously attached to fissures. It seems to have a tendency to wander about on a horizontal plane a few feet from the surface and, so far, none of the pipes I have seen have taken any distinct course or line.

Bushveld Tinfields.—In this vicinity nothing new has occurred during the year, though a considerable amount of prospecting goes on in the vicinity of Enkeldoorn, but with no favourable results.

Transvaal G.M. Estates.

The special general meeting of shareholders in the Transvaal Gold Mining Estates, Ltd., called for this week to consider amendments to the articles of association, was adjourned for a week owing to the absence of a quorum.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Steel Water Pipes.

To the Editor, *South African Mining Journal*.

Sir,—In your last issue you publish statements, the reason for which we really cannot imagine. We refer to the comparisons made between pipes made of cast iron and those made of steel. We may state that Messrs. Thomas Piggott & Co., Ltd., of Birmingham, were the pioneers of welded steel pipes. As far back as 1880 this firm supplied welded steel piping to Kimberley. These steel pipes have been recently unearthed and were found to be in a very fine state of preservation. Steel pipes are used all over the world in preference to cast iron, and we take this opportunity to put the matter right, and to ask for your usual courtesy to publish our statement of *fact* regarding the splendid preservation of the Kimberley piping after about thirty years of constant use.—Yours, etc.,

H. INCLEDON & CO., LTD.

10, New Club Buildings, Main Street,
Johannesburg, 25th August, 1913.

The Recent Loan Issue: More Suggestions.

To the Editor, *South African Mining Journal*.

Sir,—Permit me to congratulate you upon having opened the subject of the desirability of the Union Government awakening to a sense of their responsibility in regard to protecting policy holders in "foreign" insurance companies, by compelling the said companies to invest a sum of money in South African securities, sufficient to cover their liabilities in regard to their policy holders, and also for so fearlessly taking up the subject of State lotteries, as you have done in the columns of your valuable and widely read journal. In view of the undoubted influence your journal exercises, not only in this country, but also in England, I feel sure that if you do not let these subjects drop, you will be the means of doing a great deal of good in the interests of South African finance generally. As regards the "State Loans," or "Premium Bonds," may I suggest an idea that has long been a cherished one of mine? That idea is that State loans shall be issued half-yearly, each issue to pay interest and redeem a certain number of the Bonds annually, the whole issue to be redeemable in, say, 35 years from time of issue. Each issue might be for, say, £250,000—*i.e.*, £500,000 per annum—and continued for as many years as might be desirable in the eyes of the Government. The idea of having periodical issues, rather than one big one, being to enable those who are only able to save from a few shillings to a few pounds per mensem out of earnings to participate in each half year's issue. To save money and invest it in such State Premium Bonds could hardly, one would imagine, be set down as "gambling" by the most puritanical, for the simple reason that each Bond would be of the face value of £1, £5, £10, £50, as the case might be, and would always be worth its face value at least, for currency. But I venture to think that very few men or women would part with a Premium Bond for its face value, so long as a sovereign or bank note were available. It is difficult to conceive anything more likely to foster a spirit of *thrift* than such issues of Premium Bonds, as in addition to the satisfaction of knowing that every Bond held was so much money saved, there would always be the chance of drawing a premium on every Bond held, for each and every Bond not redeemed would be drawn again and again in subsequent drawings, and the ones left in till the last three or four drawings would command a premium as currency, because their chances of drawing a prize would be so much greater. The effect of such issues of Premium Bonds would of course be to lessen deposits in the Post Office Savings Bank tremendously, if not entirely, but, after all, what Government lost in this respect it would gain in respect to investments in the State loans, and for every pound lost to the P.O. Savings Bank £5 would be gained to the State loans.—Yours, etc.,

MALCOLM SEAFORTH.

Durban, 21st August, 1913.

South African Red Cross Society.

At the fourth meeting of the Provisional Executive of the South African Red Cross Society, it was reported that owing to the strike, the active organisation of the Society had been somewhat delayed, but that the Society was now in a position to arrange for classes, conduct examinations, and issue certificates (which are recognised by the Government under the Mining Regulations) of proficiency in First Aid. The mines and the members of the medical profession in the Transvaal had been advised of the objects and organisation of the Society. The Society having adopted the British Red Cross Society's text-book for First Aid classes, it was reported that a good supply of these had been received and were now available for issue. With regard to the special mining text-book to meet the needs of mine workers, it was reported that this was almost ready, and that it would be published as soon as possible. This text-book would be issued to the members of all classes studying for the special mining certificate of the Society, and would form a most valuable addition to the, at present, somewhat meagre literature on the subject. Certificates were authorised for issue to the first class held under the auspices of the Society at Krugersdorp, and examiners detailed for other classes being held. It was reported that other classes were being formed at various centres along the reef and at the dynamite factory. A number of applications for membership were approved. Arrangements for the Home Nursing and Hygiene Course of Lectures, and the Ambulance and Nursing Corps were referred to a sub-committee for report. It was resolved that it be a recommendation to the members of the Executive and General Committees that they should become Life Members of the Society. At the request of the Chemical, Metallurgical and Mining Society, the Executive agreed to undertake the organisation of the Competitions for the Surface, Underground and Colliery Workers' Ambulance Shields. The Hon. Secretary of the Society notifies us that ordinary first aid and ambulance classes will be formed in Johannesburg providing a sufficient number of ladies and gentlemen notify their intention of joining. Those desirous of attending the lectures are requested to communicate, without delay, with Mr. Fred. Rowland, the Hon. Secretary of the Red Cross Society, P.O. Box 1101, or 9, South African School of Mines Building, Eloff Street.

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Rhodesian Section.

LATEST MINING NEWS.

The July Output—Eldorado's Ore Reserves— Falcon Mines—Planet-Arcturus—Asp G.M. Co. —A Rich Strike—Shangani Mining–Kimberley Reefs' Returns—The Hanover— Lonely Reef.

THE gold output of Southern Rhodesia for July was declared on Monday at 59,268 ounces of the value of £249,302, this being an increase on the preceding month of 2,278 ounces, value £1,800. Other minerals were as follows:—Coal, 22,051 tons; chrome ore, 5,449 tons, value £12,162; diamonds, 79½ carats; lead, 27 tons; silver, 12,401 ounces, value £1,280.

* * * *

We take the following detailed statement as to ore reserves in the Eldorado Banket Mine from the report of Mr. W. F. H. Dudgeon, the consulting engineer:—These at the beginning of the year stood at 149,749 tons, of an estimated value of 15·13 dwts. This estimate was made up as follows: Main Reef (including all pillars), 51,709 tons, value 31·97 dwts.; Parallel (including all pillars), 81,489 tons, value 6·16 dwts.; broken ore lying in stopes, 6,171 tons, value 8·57 dwts.; broken ore lying on surface, 10,380 tons, value 5·50 dwts.; total, 149,749 tons, value 15·13 dwts. A complete re-calculation of the ore reserves in the mine has recently been made, and deductions made for all non-recoverable ore, such as shaft pillars, crushed pillars lost in the stopes and section found on stoping to be unpayable, etc., the total amount of such tonnage so written off being possibly 25 per cent. of these contents. The reasons for this have been gone into under the heading of "stoping." The ore reserves are now estimated as follows:—Main Reef: Ore blocked out, 12,737 tons, value 28·4 dwts; pillars, 17,020 tons, value 34·9 dwts. Parallel: Ore blocked out, 14,404 tons, value 5·4 dwts.; pillars, 4,692 tons, value 9·8 dwts. Broken ore: Underground, 16,000 tons, value 6·0 dwts.; surface, 9,973 tons, value 6·0 dwts. Total, 74,826 tons, value 16·4 dwts. In the above estimate it has only been found possible to include in the parallel ore reserves below No. 7 level some 11,977 tons valued at 5·2 dwts., the remaining blocks being considered at present of too low a grade to warrant inclusion. During the year under review, 75,648 tons have been taken from the stopes. The ore sent to the mill amounted to 87,667 tons, the difference being ore from development faces, dump, etc.

* * * *

The following cable was dispatched in mail week by the local to the London office of the Falcon Mines Company:—Cut reef on No. 7 level; north crosscut 81 ft. from shaft; well mineralised; values later. No. 2 winze east, No. 6 level, at 80 ft. down assays 10·9 dwts. gold, 5·4 per cent. copper, over 60 ins.

* * * *

From the development statement of the Planet-Arcturus for the quarter ended March 31: Ore developed for quarter: Slate, 16,037 tons; Arcturus, 19,972 tons; Planet, 3,178 tons; total, 39,187 tons. Ore in sight as at March 31: Slate, 103,846 tons; Arcturus, 126,538 tons; Planet, 15,663 tons.

* * * *

The following is the text of a cable sent to the London office of the Asp Gold Mining Company, Ltd., by the local office on the 15th inst.:—"Reef has been cut at bottom of east winze at the 360 ft. level, giving an average assay value of 15 dwts. over 66 inches. A sample of the west face gave 18 dwts. over 78 inches; face looks well."

* * * *

The following is the text of a cable sent to the London office of the Eldorado Banket Gold Mining Co., Ltd., by the local office on the 14th inst.:—"No. 11 level in crosscut No. 1 from three to ten feet reef is 84 inches wide assaying 2 ozs. 3 dwts., or 17 dwts. with high values reduced. Crosscut is still in main reef, will telegraph further particulars as soon as possible." The following is the text of a cable despatched on the 16th inst.:—"Referring to our telegram of the 14th full width is 120 inches, average value 1 oz. 15 dwts., or 16½ dwts. high values reduced."

* * * *

The Eagle mine, in the Shangani district, has given most satisfactory returns during the last few months, and the owners are so fully convinced regarding the future possibilities of the mine that they are installing a large suction gas plant with a view to increasing the number of stamps to ten, as well as effecting further improvements in the electrification of the property. Mr. Angus Macdonald (one of the partners) has been spending a few days on the mine, accompanied by Mrs. Macdonald. They returned to Bulawayo by Sunday's mail. The manager, Mr. John Macdonald, is away for a few days on business in Salisbury.

* * * *

Mr. J. H. Smith, whose property (York mine), immediately adjoins the Eagle, has been encouraged to renew his operations thereon, and is preparing to develop on a considerable scale. His plant (not having been removed), is looking bright and ready for work. "Ere long, with other adjoining properties on the line of reef, it is not too much to expect a miniature Rand in the vicinity of the historic battlefield of Shangani," says a Rhodesian correspondent.

* * * *

The following information relating to the results at the Kimberley Reefs mine from the commencement of crushing (May 7) to June 30 has been published. Tons crushed, 3,400; recovered from all sources, 592 ozs.; estimated value, £2,525; estimated cost, £3,050. Office note: In addition to the above, approximately 1,166 ozs., valued at £5,000, has been absorbed by the tube mill and zinc boxes, and this will be recovered in the usual course.

* * * *

The Teutonic mine, the property of the Hanover G.M. Co., at Filabusi, has been developing very well lately. Last month's run with the old 5-stamp battery showed a return of £1,577 worth of gold recovered from 732 tons crushed, which means a handsome profit. The old main shaft on the chief property of the company, viz., the Hanover, is to be carried down a further 100 ft., and meanwhile sinking operations on the Thorn, another of the properties of the group, have been begun and are giving promising results. A new cyanide plant is in course of erection and will add substantially to the monthly returns. It may be noted that the Hanover G.M. Co. paid out a 25 per cent. dividend last week.

* * * *

Summary of the consulting engineer's report on the Lonely Reef for the quarter ended June 30: Development work, 608 ft.; mill ran 79 days, crushed 11,596 tons, yielding 12,635 ozs. Ore reserves, 185,460 tons, average value 1 oz. No. 8 level south drive advanced from 619 ft. to 711 ft., average width of reef 27 ins., assaying 1 oz. 1 dwt.; total length of ore in this level is 890 ft., averaging 1 oz. 12 dwts. over 41 ins. No. 9 level south drive advanced from 532 ft. to 697 ft., average width of reef 39 ins., assaying 8½ dwts.; total length of ore in this level, 617 ft., averaging 1 oz. 11 dwts. over 41 ins. Winze No. 1 total depth 106 ft., average assay value 1 oz. 6 dwts. over 43 ins. Winze No. 2 total depth 114 ft., average assay value 16 dwts. over 55 ins. Winze No. 3 total depth 86 ft., average value 1 oz. over 43 ins. Office note: Driving in the 8th and 9th levels is being continued.

Rand Gold Mines.

Salisbury and Jubilee in Liquidation.

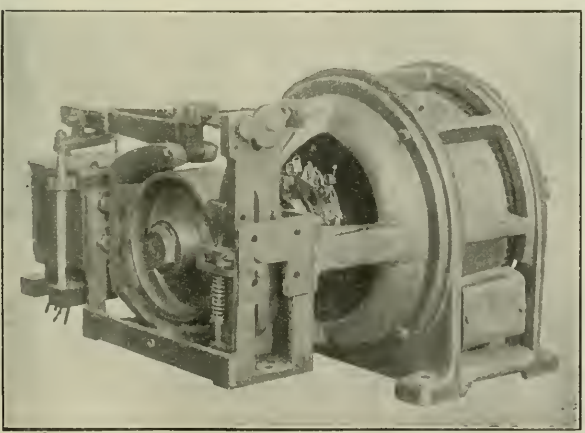
At Pietermaritzburg last week, the Salisbury and Jubilee were formally put into liquidation. At the Jubilee meeting the Chairman said:—" The business for which this meeting is called is to formally bring to a close, by going into voluntary liquidation, of the Jubilee Company. Although the company in its operations has been most successful yet it must be with a sense of real regret that we meet together for the purpose set out in the notice paper. This meeting marks the passing of one of the oldest of the Rand companies, formed, as its name signifies, in the Jubilee year of 1887. It commenced milling with a 3-stamp battery on 11th April, 1887, which were increased to eight stamps on 11th August, 1887, being ultimately formed into a 100-stamp mill jointly with the Salisbury Company. The mill was finally closed down in August, 1911. During its life of nearly 25 years the tonnage of ore taken out of the mine and sent to the mill was upwards of 100,000 tons per claim, probably constituting a record for any mine on the Witwatersrand. The dividends paid by the company amounted to £495,477 10s., equivalent to 1,215 per cent. on the capital of the company from time to time, in addition to which, on 30th November, 1898, shareholders received 80 shares in the Village Main Reef Company for every 100 shares in the Jubilee Company, Village Main Reef shares being then £7 10s., and on 30th April, 1902, a distribution was made of 37½ shares in the South City, Limited, for every 100 shares in the Jubilee Company, South City shares being then £2 10s. per share. When it was apparent some years since that the mine was nearly exhausted the Board was approached by several shareholders with a view to acquiring another property, and many enquiries were made to this end. Finally, after considerable negotiations, this company, acting conjointly with the Salisbury Company, decided to take up the Clairmont Mines in Rhodesia, which were well reported on and seemed to give every promise of success. Unfortunately all our anticipations in that direction were doomed to failure, and what looked like a most favourable venture has proved bitterly disappointing. The Clairmont Mines have been shut down for some months, and as it is quite impossible to dispose of the property on anything like reasonable terms, it has been decided to let them on tribute." The resolutions were carried without discussion, and proceedings terminated.

Glynn's Pretoria, Ltd.

The battery and plant on this property have now been erected, and it is understood that the battery was formally opened and the stamps dropped on Tuesday, the 19th inst., when a function was held on the property to mark the occasion.

De Beers' Anniversary.

The following notice, we understand, has been posted in all departments of De Beers Company's mines:—" The Board of Directors have resolved to commemorate the 25th anniversary of the formation of this company by granting to daily, weekly, and fortnightly paid employees, including apprentices, who have been in the company's service continuously for at least one year, a holiday of two consecutive weeks annually on full pay for 14 days. This privilege to be cumulative, but not to exceed six weeks' leave." This concession, it will be remembered, was foreshadowed in a speech delivered by Sir David Harris a few weeks ago.



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UNION MINING STATISTICS FOR JULY.

Gold and Silver Production—Development Returns—Coal and Other Minerals.

The following are the usual monthly returns, compiled and issued by the Government Mining Engineer's Department, of the principal statistics relating to the mineral production of the Transvaal and the Union. Total value of mineral output, gold, silver, coal and other metals and minerals, excluding diamonds, for July, is £3,033,562. The total for the seven months of the current year is £24,475,568. For July the Government returns of the gold output of the Transvaal record a total of 651,484.762 ozs. of fine gold, of a value of £2,767,302, the contribution from other Provinces being nil. The Government return for the Witwatersrand is £619,432.576 ozs., value £2,631,183, against the Chamber's declaration of 2.655,286 ozs., value £2,783,917, which is less by 5,674 ozs., value £24,103, than the figures shown by the Chamber. From the outside districts the Government analysis gives 32,052.186 ozs., value £136,149, against the Chamber's figures of 30,282 ozs., value £128,631, the difference in this case being 1,770 ozs., value £7,518 less than the figures shown by the Chamber. The number of mines dropping stamps on the Witwatersrand is given as 54, while the Chamber shows 51 companies making returns besides gold recovered by miscellaneous producers. In the number of mines milling in respect of what are termed outside districts, the Chamber's analysis shows two mines producing gold at Heidelberg, four at Barberton, three at Lydenburg, and one at Klerksdorp, besides miscellaneous producers, while the Mines Department shows two for Heidelberg, three for Klerksdorp, one for Ottoshoop, eleven for Barberton, twelve for Pilgrim's Rest, and three at Pietersburg. The total number of all mines crushing is 86. In addition there were 39 mines, works, and gold-producing concerns returning gold not included in the above total. The number of stamps dropping is given for the Rand at 9,465, for Heidelberg 100, for Klerksdorp 69, for Ottoshoop 5, for Barberton 207, for Pilgrim's Rest 137, and for Pietersburg 30, making a total of 10,013. The number of tube mills operating on the Rand was 218, Heidelberg district 2, Klerksdorp district 2, Barberton 3, and Pilgrim's Rest 5, the total for the Transvaal being 290. The gold production in the different districts of the Transvaal for July is as follows :—

	Ozs.	Value.
Witwatersrand	619,432.576	£2,631,183
Outside districts—		
Heidelberg	6,869,426	29,180
Klerksdorp	2,563,697	10.890
Ottoshoop	33,016	140
Barberton	7,687,661	32,655
Pilgrim's Rest	14,569,046	61,885
Pietersburg	329,340	1,399
Totals	651,481.762	£2,767,332

In the detail of sorting the system of tabulation sets out that the producing mines on the Rand sorted out during July was 10.78 per cent. of the tonnage mined, as against 10.8 for June, 11.28 for May, 11.87 for April, 11.67 for March, 11.69 for February, 12.07 for January, 11·7 for December, 1912, 11·94 for November, 12·24 for October, 12.46 for September, 13.14 for August, 13.16 for July, 12.73 for June, 13.18 for May, 12.81 for April, 12.88 for March, 10.03 for February, and 12.76 for January. The tonnage milled on the Rand amounted to 1,871,960 tons, and for the whole of the Transvaal 1,947,572.

ROCK DRILLS.

The average number of machine drills in use in the gold mines during each month for the past thirteen months was :—1912 : July 5,505, August 5,482, September 5,610, October 5,614, November 5,845, December 5,717. 1913 : January 6,178, February 6,057, March 6,201, April 6,190, May 6,042, June 6,220, July 5,453 ; of which 5,366 were on the Rand, 49 at Heidelberg, 10 at Klerksdorp, 23 at Barberton, and 5 at Pilgrim's Rest.

DEVELOPMENT.

For all districts the figures for ore handled and treated during July are :—

	Rock hoisted. Tons.	Rock milled. Tons.
Witwatersrand	2,205,320	1,871,906
Heidelberg	23,349	18,310
Klerksdorp	13,352	12,061
Ottoshoop	50	50
Barberton	25,363	18,844
Pilgrim's Rest	25,077	24,084
Pietersburg	2,745	2,263
	2,295,229	1,947,572

The number of feet driven on development and on main drives and crosscuts was : On the Rand, 33,391, and in outside districts 7,051. On main shaft sinking on the Rand a total of 1,863 feet in depth was attained, and in outside districts 227 feet. Other development on the Rand accounted for 20,613 feet, and outside districts 1,565 feet.

COAL PRODUCTION.

The number of mines producing coal in the Transvaal is returned at 29. The quantity sold was 461,212 tons for the month, which shows an increase of 12,431 tons as compared with the previous month. The total value of the coal realised at the pit's mouth is given at £102,749, which is an increase of £3,862. The details of the production for July are :—

	No. of Coll.	Tons sold	Value £	Value per ton s.	d.
Springs	4	48,957	£12,924	5	3.36
Middelburg	15	346,255	76,920	4	5.32
Other areas	10	66,000	66,000	3	10.93
	29	461,212	102,749	4	5.47

The average percentage of waste sorted out was 12.79.

UNION RETURNS.

	Coll.	Tons sold.	Value £	Value per ton s.	d.
Cape	9	6,024	3,437	11	4.93
O.F.S.	5	60,466	15,656	5	2.14
Natal	21	248.068	75,236	6	0.79
Transvaal	31	461.212	102,749	4	5.47
Totals	64	775,770	197,078		

COPPER.

The output of marketable produce for July was :—

	Tons	Pure Metal p.c.	Tons	Value Shipped £
Transvaal	456.730	44.6	524.416	£14,261
Cape	876.	48.42		
	1,332.73		524.416	£14,261

TIN.

The marketable output of tin for July was :—

	Tons	Pure Metal p.c.	Tons	Value Shipped £
Transvaal	302.468	68.85	286.828	£33,401
Cape	8.96	72.	16.324	2,072
	311.428		303.152	£35,473

OTHER MINERALS.

Minerals other than gold, coal, copper and tin for July were :—

Transvaal.

Minerals.	Tons.	Value.
Graphite	5.213	£162
Magnesite	55	149
Flint	25	151
Lime	5,186	8,207
Miscellaneous	47.886	182
	Ozs.	
Silver in gold bullion	69,463.85	8,218

Union of South Africa.

Minerals.	Tons.	Value.
Asbestos	78.444	£1,305
Graphite	5.213	162
Magnesite	55	149
Lime	5,609	9,174
Flint	25	151
Miscellaneous	55.519	258

Total Mineral Output.—Gold, £2,767.332; silver, £8,218; coal, £197,078; base metals, £60,934; total, £3,033,562.

ACCIDENTS.

From the table of accidents the followiug extracts are reproduced, the total number of separate accidents for July being 203 for the Transvaal, and for the Union of South Africa 249. For the whole Union the figures are :—Whites, killed 11, injured 22; coloured, killed 82, injured 189. *Explosives* : Appended is a summary of the statement showing the number of cases of explosives manufactured during July :—Transvaal, 19,941 ; Cape, 34,154 ; Natal, 15,789 ; total, 69,884.

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RAND YIELD, COSTS, AND PROFITS IN JULY.

Summary of Chamber of Mines' Analysis.

THE following tabulation of the operations of the mines of the Transvaal contributing to the gold production is supplementary to the details published by the Chamber of Mines in its declaration on the 10th of the month:—

THE WITWATERSRAND.

	Total value recovered	Value recovered per ton milled.		Total working cost per ton milled		Total working costs	Working profit	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	£	s.	d
1. Aurora West United ...	17,696	26	1	20	5	13,724	3,990	5	11
2. Bantjes Consolidated ...	33,791	29	5	23	2	26,623	6,819	5	11
3. Brakpan Mines . .	54,932	27	5	23	5	46,436	8,005	4	1
4. Cinderella Cons.	3,135	—		—		—	—	—	
5. City Deep	70,096	40	11	27	10	46,833	21,395	12	8
6. City and Suburban .	66,082	40	8	24	0	26,415	38,961	16	4
7. Cons. Langlaagte ...	55,232	25	9	17	10	38,219	17,013	7	11
8. Cons. Main Reef	32,712	32	11	24	9	24,568	7,776	7	10
9. Crown Mines	273,333	30	1	16	7	150,432	119,928	13	3
10. Durban Roodepoort ..	14,417	21	4	16	2	10,918	3,500	5	2
11. Durban Rood. Deep ...	33,052	28	0	24	5	28,767	3,876	3	3
12. East Rand Proprietary.	175,686	31	4	22	11	125,007	44,098	8	1
13. Ferreira Deep	104.944	42	1	20	1	49,739	53,629	21	7
14 Geduld Proprietary ...	4,464	—		—		18,735	*14,279	—	
15. Geldenhuis Deep	70,495	29	0	25	0	60.734	9,007	3	8
16. Ginsberg	17,713	28	4	22	8	14,156	3.556	5	8
17. Glencairn Main Reef ...	14.944	14	10	13	11	13,645	1,300	1	4
18. Jupiter	34,530	20	2	19	3	32,991	1,203	0	8
19. Knight Central	23,558	22	6	23	11	24,771	*1,151	*1	6
20. Knights Deep . .	43,059	12	9	15	3	47,018	*7,761	*2	6
21. Langlaagte Estate . .	49,040	18	0	16	9	40,391	11,022	4	7
22. Luipaardsvlei Estate .	15.899	22	8	21	6	15.073	650	0	11
23. Main Reef West . ..	26,366	30	5	27	0	23,408	2.634	3	0
24. May Consolidated . .	13,639	19	11	15	3	10,432	3,173	4	8
25. Meyer and Charlton	32,444	48	11	19	5	12,614	19,698	30	3
26. Modderfontein B. .	66.524	45	6	18	8	25,342	40,480	29	10
27. New Goch	23,018	19	6	18	3	21,513	1,653	1	5
28. New Heriot	20,916	35	7	23	4	13,413	7,255	12	7
29. New Kleinfontein	55,870	26	1	30	5	65,131	*9,753	*4	7
30. New Modderfontein . .	68,732	45	9	23	0	34,639	33,365	22	3
31. New Primrose	33 778	28	9	14	7	17,042	16,735	14	4
32. New Riotfontein .	15,347	21	11	23	0	16,134	*786	*1	1
33. New Unified	14.379	25	3	19	1	10.821	3,559	6	3
34. Nourse Mines	70,572	30	0	21	10	51,380	18,492	7	10
35. Princess Estate ..	25.741	27	0	27	0	25,664	5	—	
36. Randfontein Central ...	237,898	24	9	17	4	166,562	68.524	7	2
37. Robinson	90,362	34	0	14	3	37,735	51,287	19	5
38. Robinson Deep	72,101	26	7	16	0	43,457	27,851	10	3
39. Roodepoort United	22.194	20	10	21	2	22.048	208	0	2
40. Rose Deep	74,140	24	3	16	5	50,210	23.154	7	6
41. Simmer and Jack ...	60,602	18	6	11	10	38,692	21,110	6	5
42. Simmer Deep	40.884	15	6	14	6	38,280	2,197	0	10
43. Spes Bona Tribute . .	5.365	18	4	—		—	—	—	
44. Van Ryn	34,780	24	3	17	8	24.966	14,844	10	6
45. Village Deep	52,498	29	11	24	3	42,607	9.260	5	3
46. Village Main Reef . .	63,159	36	10	18	10	31,817	29,717	17	7
47. Vogelstruis Estate	13,746	21	2	20	10	13.078	688	1	1
48. West Rand Central	3.645	37	9	33	3	3,216	431	4	5
49. West Rand Cons. ...	38.523	29	0	24	1	32 035	6,456	4	10
50. Witwatersrand ...	40,234	24	6	15	8	25.804	14,429	8	9
51. Wit. Deep . .	63,300	31	2	19	1	37,858	24,354	12	3
52. Wolhuter	35,753	26	8	20	6	27,478	7,827	5	10
Miscellaneous producers	29,965	—		—		—	—	—	
Witwatersrand totals	2,655,286	27	6	19	4	1799826	785,263	8	5
*Loss.				49 cos.		49 cos.	49 cos.	49 cos.	

The apparent small disagreement between working costs and profits per ton milled and value per ton is due to inclusion of value won from accumulations and by-products.

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Total working costs.	Working profit.	Working profit per ton milled	
HEIDELBERG—									
1. Nigel	20,453	30	0	24	5	16,230	3,992	6	0
2. Sub Nigel	8,266	33	0	28	6	7,145	1,015	4	1
BARBERTON—									
3. Barrett	918	6	11	—		—	—	—	
4. Sheba	13,758	41	2	28	8	9,353	4,404	13	6
5. Sheba-Rosetta	799	20	5	—		—	—	—	
6. Worcester	5,327	17	6	11	11	3,631	1,695	6	7
KLERKSDORP—									
7. Quest	2,944	15	1	14	10	2,894	50	0	3
LYDENBURG—									
8. Ceylon Lydenburg	1,308	38	11	21	2	713	575	17	[illegible]
9. Glynn's Lydenburg	8,389	44	7	19	11	3,751	4,544	24	2
10. Transvaal G.M. Estates	42,439	56	9	19	4	14,237	26,93[illegible]	36	[illegible]
Total (outside districts)	128,631	35	11	21	6	57,953	43,214	16	[illegible]
				8 cos		8 cos.	8 cos.	8 cos.	
Grand totals	2783917	27	8	19	5	1857779	828477	8	8
				57 cos.		57 cos.	57 cos.	57 cos.	

A comparison of value recovered per ton milled, working costs and profits per ton with June shows that the value recovered on the Witwatersrand for July was 27s. 6d., exactly the same as for June. Working costs in July were 19s. 4d.; in June 17s. 8d.; in May 17s. 7d.; in April 17s. 11d.; in March 17s. 8d; in February, 18s. 3d.; and for both January and December 18s.

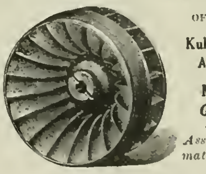
For January the tonnage milled was 2,2[illegible] tons; for February, 2,100,137 tons; for March, 2,321,254 tons; for April, 2,361,0[illegible]9 tons; for May, 2,366,726 tons; for June, 2,177,354 tons; and now for July, 1,873,980 tons. In the outside districts the total tonnage milled was 57,347, making a total for the Transvaal of 1,931,327 tons.

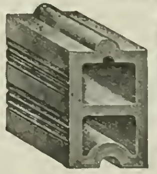
The total dividends declared for 1913 to date are: Witwatersrand, £3,965,651; outside, £215,592; total, £4,181,243.

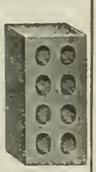
The total dividends for the two years were: 1911, £8,[illegible]; 1912, £8,277,862

Manicaland Mineral Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland), for the month of July, 1913, was as follows:—Reef: Mill: Gold won (fine gold), 431 ozs. 17 dwts. 14 grs.; tons crushed, 1,712; value, £1,813 17s. 2d. Concentrates (estimated): Gold (fine gold), 40 ozs. 16 dwts. 3 grs.; tons, 7,705; value, £173, 8s. 7d.; silver and lead value, £53 4s. 3d. Cyanide: Gold recovered (fine gold), 13 ozs. 2 dwts. 0 grs.; tons treated, 98; value, £55.







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SESSION OF 1913-14.

Matriculation Examination, Sept. 23rd-27th.

Particulars of Curricula for University Degrees and College Diplomas in Engineering, Electrical Engineering, Naval Architecture, Mining, Metallurgy, Agriculture, Pure Science, Arts and Commerce, and of Fellowships, Scholarships, and Exhibitions, on application to:

F. H. PRUEN, M.A., Secretary.

THE WEEK IN THE SHAREMARKET.

Steady and Quiet—Awaiting a Lead—Modder B.'s Rise.

The market has exhibited a steadier tendency this week, without any great activity. Tin and diamonds have had some business, and at generally higher levels. Among Rand stocks, Modder B.'s have been in demand, and the majority of other East Rand shares have been firmer in sympathy. The opinion in well-informed quarters seems to be that no active general market can be expected for some time, though specialities will doubtless be in favour. It is thought that base metals and diamonds will monopolize activity for some time to come.

	Friday, 22nd.	Sat., 23rd.	Mon., 25th.	Tue., 26th.	Wed., 27th.	Thur., 28th.
Adair Ushers ..	0 6B	0 6B	0 6B	—	—	0 6B
African Farms ..	14 7B	14 6B	14 6B	14 9B	14 10B	14 9B
Apex Mines ..	18 0B	19 0S	19 0S	17 6B	18 6S	18 0
Bantjes Cons. ..	15 0B	16 0S	15 0B	15 0B	—	15 0B
Benoni Cons. ..	2 0B	2 3B	2 3B	2 3B	2 3B	—
Brakpan Mines ..	—	60 0	60 0B	60 0B	—	—
Breyten Collieries..	27 6B	—	30 0S	29 0S	—	30 0S
British S.A. ..	—	—	—	21 6	21 0B	—
Bushveld Tins ..	0 9S	—	0 9S	—	—	0 6B
City & Subs. (£4) ..	42 6	42 0B	42 0B	42 0B	42 0B	42 6B
City Deeps.. ..	53 6	53 0B	53 0B	54 0B	54 0B	53 9B
Cloverfield Mines ..	4 6	4 0B	4 0B	4 0B	4 4B	4 3B
Clydesdale Colls. ..	10 0S	10 0S	8 0B	—	8 0B	—
Concrete Constr. ..	5 0S	5 0S	5 0S	—	—	—
Cons. Langlaagtes	24 0B	24 6B	—	24 0B	24 0B	—
Cons. Main Reef ..	17 6S	17 6S	16 0B	16 9B	16 0B	16 3B
Coronation Freeholds.	0 5B	0 5B	—	0 5B	—	0 5B
Crown Diamonds ..	10 0B	10 3B	10 3	10 3B	10 6	10 0*
East Rand Centrals	8 0	7 6B	7 9B	7 9B	7 9B	7 6B
East Rand Coals (2/6)	1 9B	1 10	1 9B	1 9B	1 9B	1 9B
East Rand Deeps...	1 6B	—	1 6B	—	1 5B	1 4B
East Rand Props.	45 0B	44 9B	44 6B	45 0B	—	—
Eastern Golds (1/-)	1 3B	1 3B	—	—	1 3B	1 3B
Frank Smith Diam.	7 3	7 0	6 9	7 3	7 6	7 3B
Geduld Props. ..	—	20 6S	20 0B	—	—	20 3B
Geldenhuis Deeps	—	—	30 0S	—	—	—
Ginsbergs	25 0S	25 0S	—	—	22 6S	—
Glencoe (Natal) Colls.	7 3B	7 6S	7 3B	—	7 3B	7 6B
Glynn's Lydenburgs	—	—	13 0B	—	14 6S	14 6S
Government Areas	20 6B	20 3S	20 9	—	20 9	20 6B
Jumpers	—	4 6S	—	—	—	—
Jupiters	—	5 0B	—	—	5 6S	—
Kaalfontein D. (2/6)	0 3B	0 3B	0 4S	0 3B	0 3B	0 3B
Klerksdorp Props...	2 1B	2 1B	2 0B	—	2 0B	2 0B
Knights Centrals ..	8 0B	8 0B	8 0B	8 3	8 0B	7 9B
Knights Deeps ..	—	—	—	—	40 0S	—
Lace Props. ..	2 9B	—	2 9B	2 10B	2 9B	2 6B
Lydenburg Gold Fms.	3 3S	2 6B	—	2 9B	—	2 9B
Main Reef West Debs.	£60B	—	£60B	£60BS	£60B	£60B
Main Reef West ..	9 0B	8 9B	9 0B	9 3B	9 0B	9 0B
Middlevlei Estates	—	1 0B	—	1 0B	1 0B	1 0B
Modder B's ..	—	—	—	75 0B	77 6B	77 6B
Modder Deeps ..	29 6	28 9B	29 0	29 0	29 0B	29 3B
Natal Navigation Col. ..		—	14 0B	14 0B	—	—
New Era Cons. (5/-)	6 9B	6 9B	—	6 9B	6 9B	6 9B
New Geduld Deeps	—	1 10B	—	1 9B	1 10B	—
New Kleinfonteins	18 9B	19 3B	19 0B	19 0B	19 0B	19 0B
New Modders ..	—	—	—	217 6B	—	—
New Unifieds ..	14 3S	14 3S	—	—	14 3S	14 3S
Nigels ..	15 0B	—	—	—	16 3B	—
O.F.S. & Trans. Dia.	1 9B	1 9B	1 10B	1 9	1 9B	1 9B
Pickstone Golds ..	42 6S	—	—	—	—	—
Pretoria Cement Co.	49 0S	49 0S	49 0S	49 0B	48 0S	48 6S
Princess	4 0B	4 0B	—	4 0B	4 0B	4 0B
Rand Collieries ..	—	2 6B	—	—	—	—
Rand Klips ..	1 0B	1 0B	1 3B	1 3B	—	1 0B
Rand Nucleus ..	2 0B	—	1 11B	2 0B	2 1B	2 0B
Randfontein Deeps	3 6B	—	3 0B	—	—	—
Randfontein Estates	26 3B	26 3B	26 0B	26 3B	26 3B	26 3B
Robinson Deeps ..	—	31 0B	—	31 3B	31 6	31 6B
Rooiberg Minerals	27 6B	27 3B	27 0B	27 6B	27 0B	27 0B
Rose Deeps ..	50 0B	—	—	—	—	—
Shebas	5 0B	5 0B	5 0B	5 0B	5 0B	5 0B
S.A. Breweries ..	39 6B	39 6B	—	—	39 6B	39 6B
S.A. Lands ..	3 2	3 1B	3 1B	3 1B	3 2	3 1B
Springs Mines ..	15 6B	15 6B	15 9B	15 0B	15 9B	15 6B
Sub Nigels ..	9 3B	—	9 3B	9 3B	9 6B	9 6B
Swaziland Tins ..	—	—	44 6B	43 6B	—	44 0B
Trans. & Delagoa ..	—	—	—	—	37 6B	37 6B
Trans. Coal Trusts	36 0*	36 3B	36 6B	36 6	36 6B	36 0B
Trans. G.M. Estates	51 0B	51 0B	51 0B	51 0B	51 9B	52 0B
Van Ryn Deeps ..	29 3	29 0B	29 3B	29 6B	29 9B	29 9
Village Deeps ..	—	—	—	—	38 6B	39 0S
Witbank Collieries	40 0B	40 3B	—	41 0B	41 0B	41 0B
Witwatersrands ..	65 0B	—	65 0B	—	67 0†	—
Wit Deeps ..	—	—	53 0B	54 0B	54 3B	54 5B
Wolhuters	13 3B	13 3B	13 0B	13 0B	13 0B	13 0B
Zaaiplaats Tins ..	37 6	37 0B	36 9B	36 6B	37 0	37 6

B Buyers. S Sellers. *50 Shares. †Ex-London.

MINING MEN AND MATTERS.

Sir George Albu and Mr. Max Francke left by this week's mail boat for England.

* * * *

Mr. Colin Ferguson, managing director of the Randfontein Estates, returned from a visit to England by this week's mail boat.

* * * *

Mr. John Wallace has been elected Chairman of the Witwatersrand Commercial Exchange, and Mr. R. H. Philpot Vice-Chairman.

* * * *

Sir Abe Bailey has announced his intention of returning to South Africa, "in the autumn"—whether the European or South African autumn, he does not say.

Swaziland Tin.

The following are the particulars in regard to operations for the month of July, 1913:—Concentrates recovered, 26·985 long tons; estimated profit (taking the price of tin at £180 per ton) £995; adjustments in respect of previous shipments due to fluctuations in the price of tin, to be added, £743; profit for the month, £1,738. As frequently happens in the initial stages of a change over to a new plant, there have been unforeseen delays and stoppages which have adversely affected the month's output, but which should not recur.

Explosives in Household Coal.

During the year 1912 five explosions were recorded in the Department of Mines of explosions in stoves or fireplaces of private houses. Inquiry elicited the fact that in four instances the coal came from the Cornelia Colliery, and in one case from the Rietfontein Colliery. The violence of the explosion in these cases furnishes very strong reason for coming to the conclusion that the accidents were due to explosives being left in the coal, and points to insufficient care in removing this source of danger to unsuspecting householders and others.

Assays and Analyses of Minerals.

NOTICE TO PROSPECTORS AND OTHERS.

The attention of Prospectors and others is invited to Notice No. 1037 of 1913, appearing on page 679 of the *Union Government Gazette* of the 29th July, 1913, which specifies a special schedule of fees for the assay and analysis of minerals fixed for the benefit of prospectors and others who are financially unable to make their own arrangements.

The above notice can be seen at all offices of the Mines Department in the Union.

METAL-MINE ACCIDENTS DURING 1911—II.

Some Interesting Comparisons—Rates for Other Countries.

[Compiled by Albert H. Fay.]*

Publication of Accident Statistics.

In the publication of these statistics, it is not the purpose of the bureau to usurp in any way the field covered by the annual or biennial reports of the State mine inspectors or mining departments. A number of States have no inspectors for metal mines and there is a lack of uniformity in the reports issued by the various States that have inspectors. The tabulated forms in which these statistics are here published must be regarded as tentative and subject to revision. The Bureau of Mines will be glad to receive suggestions from State inspectors and others interested in mining as to the form in which data can be presented most effectively and as to how their publication can be made most useful to the mining industry. The figures given herein were submitted to the various inspectors, in the case of those States having an inspection service, for verification, and in most cases the bureau has received their hearty co-operation. Only a few of the States collect statistics covering serious injuries and still fewer give any attention to the slight injuries; so that on these points it is impossible to check closely. The total number of deaths reported in the various States agrees closely with the inspectors' reports, yet there is some variation as to the classification. The bureau has maintained its original classification on account of the difficulty of devising a scheme that would conform to all of the States. Again, since some of the States have no mine-inspection service, the use of the same classification for the entire country seemed to be the only method. This places all of the statistics on the same basis, and it will render easier the making of comparisons and the drawing of conclusions.

Serious and Slight Injuries.

The definition of an accident, which is the fundamental question, is different among the various mining companies. One operator may require a detailed report of any casualty, however slight, that delays the worker, or that draws blood; another may not consider an accident worthy of record that does not come to the attention of the foreman or shift boss. One of the large mining companies defines an accident as follows: An accident is any internal or external injury, feigned or actual, involving any or no loss of time, resulting directly or indirectly from our operations, regardless of cause or degree of severity, occurring to the person of an employee while going to, coming from, or actually engaged on company work or property. It also includes an accident to any non-employee resulting directly from any of our operations.*

Many companies have so increased the list of reportable accidents that statistics seem to show a far greater number of casualties now than in the past. This is especially true of the iron and copper mines in the Lake Superior district. If the accident rate in one State seems unusually high when compared with other mining districts, it may be due to the fact that more complete records have been kept. The larger companies in the west are keeping excellent records in connection with their hospital departments. The companies employing only a few men with no hospital service, as a rule do not keep a complete register of the serious and slight accidents, hence these ratios in some States may be low, but such low rates do not necessarily indicate that the danger is less than in other States. The distinction made in this paper between a serious and a slight injury is entirely arbitrary and is more or less tentative. A line had to be drawn at some definite point, and hence a serious accident is considered in this report as one that would disable a man and keep him from duty 20 days or more. This class includes such injuries as broken arms and legs, loss of eye, and severe cuts and bruises. A slight injury is considered as one that involves a loss of time of not less than one day nor more than 20 days. Under this class may be placed such injuries as cuts, sprains, mashed fingers, bruises, dirt in eye, slight burns, effect of powder smoke, etc. Of course any slight injury may become infected and thus result in a serious accident as defined above.

Metal-Mine Accidents and Coal-Mine Accidents Compared.

A table gives in parallel columns the number employed, the number killed, and the death rate per 1,000 employed in both metal mines† and coal mines in the United States for the year 1911. This table shows that the total number of men employed in the coal mines of the United States was 728,348 as compared with 165,979 men in the metal mines. The total number killed in the coal mines was 2,719 as compared with 695 in the metal mines. The death rate in the former was 3·73 per 1,000 and in the latter 4·19 per 1,000 men employed. The majority of States have established systematic coal-mine inspection, which tends to reduce the accidents; whereas in many of the States where metal mining is carried on there has been no inspection of mines, and in some States there has not been adequate inspection of metallurgical plants, foundries, rolling mills, refineries, etc., which employ in the aggregate nearly 1,000,000 men. On account of the large disasters that occur in the coal mines and the prominence given to them by the newspapers, coal mining is usually considered more hazardous than metal mining. The metal mines as a rule do not claim their death toll in disasters that involve many men. The large majority of men killed in the metal mines are killed one at a time, and in the list of accidents for 1911 the largest disaster reported was a mine fire, by which 17 men were killed. The second largest was at a mine where 14 men were killed by being buried under a mass or rock, resulting from a slide of bank. The third largest was where water broke into a shaft from old workings and caught 12 men. Two mine fires occurred in each of which 7 men lost their lives. One hoisting accident claimed 6 and one powder explosion killed 6 more. Altogether, there were reported in the metal mines in 1911, 40 accidents, in which 2 or more men were killed at one time, making the total thus killed 135, or 19·5 per cent. of all the fatalities.

Gold and Miscellaneous Metal Mines.

The accidents in and about the gold and miscellaneous metal mines are compiled from the reports of 3,817 operators, employing 48,919 men, of whom 35,176 were underground and 13,743 surface men. The deaths and injuries due to accident are as follows: Deaths 193, or 39·5 per 1,000 men employed; serious injuries 540, or 11·04 per 1,000; slight injuries 3,078, or 62·92 per 1,000. Of the total number of fatalities, 163 occurred underground, or 4·63 per 1,000, and 30 on the surface, or 2·18 per 1,000. The rates of serious and slight injuries are low when compared with the iron and copper mines. This may be accounted for in part by reason of the fact that this group includes many prospects and small mines that keep no records. Fatal accidents impress themselves on the memory and are easily reported. The serious and slight injuries are soon forgotten if not recorded. Many of these mines are in States where there is no inspection, and they are not required to keep accident records. Many of the larger companies operating gold and silver and lead-silver mines of the west have, for their own protection, hospital service and medical aid for their employees. The reports from some of these large companies show that excellent records are being kept.

Causes and Distribution of Accidents.

In another table is given the percentage of accidents due to any one cause in each group of mines and for all of the mines combined. 34·46 per cent. of the deaths in copper mines, 35·44 per cent. of the serious injuries, and 31·09 per cent. of the slight injuries are due to falls of rock or ore from roof or wall. A similar comparison may be made for any one of the 37 causes enumerated. This table also shows that approximately two-thirds of the total deaths and injuries that occur in and about the metal mines are caused as follows:—Of the fatal accidents, 32·52 per cent. are due to falls of ore or rock from roof, wall, or bank; 11·23 per cent. to explosives; 15·39 to falling down stope, shaft or winze; and 5·32 per cent. to mine fires. Of the serious accidents, 31·37 per cent. are due to falls of roof, wall, or bank; 19·05 per cent. to car and haulage systems; 12·19 per cent. to machinery; and 6·41 per cent. to timber and hand tools. Of the slight accidents, 28·86 per cent. are due to falls of roof, wall, or bank; 15·52 per cent. to car and haulage systems; 10·10 per cent. to machinery; and 8·02 per cent. to timber and hand tools. The following table gives the number of men employed and number of men killed and injured in and about the metal and miscellaneous mines in the United States in the calendar year 1911:—

Mines.	Number. employed..	Number killed.		Number seriously injured.		Number slightly injured.		Widows.	Orphans
		Total.	Rate per 1,000 employed.	Total.	Rate per 1000 employed.	Total.	Rate per 1000 employed.		
Copper.	44,693	238	5·33	1,326	29·67	9,016	201·7	91	195
Iron	45,953	197	4·29	2,032	44·22	8,690	188·3	114	237
Lead and zinc (a) ..	12,521	43	3·43	177	14·14	1,311	104·7	26	40
Gold and miscellaneous metal	48,919	193	3·95	540	11·04	3,078	62·9	61	118
Miscellaneous minerals ..	13,893	24	1·66	94	6·77	313	22·5	5	10
Total	165,979	695	—	4,169	—	22,408	—	297	600
Average.	—	—	4·19	—	25·12	—	135·0	—	—

(a) Mississippi Valley only.

Methane.

A peculiar class of accident on Witwatersrand mines is the occurrence of explosions of gas from time to time, says the Government Mining Engineer in his annual report. These occur in the deeper workings and seem to be due to pockets of inflammable gas, most likely methane, which are probably imprisoned under pressure in clefts or cavities and which escape into the drive when the cavity is tapped. The source of the inflammable gas is obscure, but probably all sedimentary formations contain sufficient organic matter to yield some methane by decomposition during geologic ages. The explosions are not numerous enough to call for special precautions, but when they have occurred have generally resulted in injury to someone. The only precaution that seems reasonable is to be on guard whenever the hissing noise of escaping gas is heard issuing from rock.

We understand that the liquidator of the S.A. Amalgamated Jewish Press, Ltd. (in voluntary liquidation), has disposed of the names and goodwill of the *S.A. Jewish Chronicle* and the *Jewish Standard* to the S.A. Jewish Publications, Ltd., of which Mr. L. Lionel Goldsmid, B.A., J.P., is the managing director.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME

His Majesty's Theatre.—Mr. W. E. Holloway's Company ...	8.15
Standard:	See bills.
Empire	8.15
Carlton	7 to 11.15
Grand	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 & 9

INVESTORS' DIARY.

The following company meetings have been announced:—

Sept. 9.—Coronation Collieries.
Sept. 12.—Swaziland Tin.
Sept. 19.—Transvaal Gold Mining Estates (special).
Sept. 19.—Transvaal Gold Mining Estates.
Sept. 26.—Simmer and Jack Prop.
Sep. 26.—Sub-Nigel.
Oct. 29.—Rooiberg Minerals.
Oct. 31.—Knights Deep.
Nov. 5.—New Boksburg Gold Mines.

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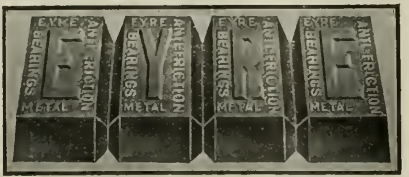

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PHONE 2151. BOX 6468.

Electrical Notes.

Safety Rules for Electrical Work.

The following rules, which are taken from a book of rules issued by the Inland Steel Company, of Chicago, U.S.A., contain some useful points for the attention of workmen and others engaged in work connected with the supervision or handling of electrical machinery and appliances:—(1) Power feeders above 250 volts shall be handled with great care, as carelessness may cause a fatal accident. Such systems should never be worked upon outdoors when live, during rainy or damp weather, and otherwise only with the approval of the electrician. (2) The 250-volt direct-current power circuit under ordinary conditions is not likely to cause death by shock; but the same precautions should be observed in handling this circuit as in handling those of higher voltage, not only to avoid possible injury from shocks and burns, but to form habits of precaution in handling wires. Remember that it is possible to receive a fatal shock from a 125-volt circuit under certain conditions. (3) So far as possible, treat all circuits as though they were live, even though you believe them to be dead. (4) Never handle electric wires while standing or sitting in a wet place, without extra precaution to obtain insulation from the ground. (5) In handling any circuit known to be live, whenever possible use only one hand. It is best to keep the other hand behind the back. The most dangerous shocks are those from hand to hand. (6) When working upon live circuits, take care to work upon but one wire at a time and properly insulate yourself from the ground and from other wires of the circuit. Insulate each joint as it is made before starting on another wire. Be sure you are properly protected from falling from a high position in case of shock. Careless haste in working on live circuits is the cause of most accidents. Be cautious and alert at all times and under all conditions. (7) The insulation on electric wires cannot be depended upon to protect you from shock. Avoid working upon any live circuits as much as possible. (8) Never close a switch without full knowledge concerning the circuit and why the switch was opened. (9) When an electrical worker is engaged at pole work or other overhead work, he should wear a belt and safety strap. (10) Tape the handles of your tools, to assist in preventing short-circuits across them. (11) If you see any person handling electrical apparatus who has no right to do so, stop him at once and report the matter to his foreman. (12) If you see any electrical equipment in unsafe condition and improperly operated, correct the conditions or report the matter to the proper foreman. (13) There are many special conditions which make electrical work dangerous. Even telephone or signal wires may become crossed with high-tension wires and become dangerously charged. It is not possible to explain in detail all such possible cases, but competent workmen are always afraid. (14) Never look at an intense arc without adequate protection, such as heavy blue or black glasses. Intense pain results from exposure of the delicate nerves of the eyes to the intense light of the electric arc. As this pain does not manifest itself until several hours afterward, you should immediately seek the advice of the doctor, if you have so exposed your eyes, in order to avoid suffering. (15) When you complete a job, never leave tools or material overhead and always replace safeguards. (16) You must have the switch open when working on a lamp. (17) Do not throw or leave pieces of carbon where a person is liable to step on them and lose his footing. (18) Carefully inspect wires, ropes, arms, etc., when trimming lamps, and report defective conditions immediately.

Accidents in Connection with Electrical Plant.

The annual report of the Government Mining Engineer shows that there has been no increase in accidents in connection with electrical plant, although the use of electrical power is extending. There were fourteen separate accidents, resulting in eight deaths, as compared with the respective totals of fourteen and nine for the previous twelve month. The accidents have been classified as follows:—

	Accidents.
"A"—Contact with broken or bare live wires underground or with escaped current underground	2
"B"—Contact due to slipping and catching hold of wires underground	1
"C"—Contract through unauthorised approach or in dangerous places insufficiently fenced	2
"D"—Contact with live parts or burnt by arc while engaged on legitimate work on poles, switchboards, transformers, etc....	4
"E"—Contact by unskilled persons working on or near cables or switchboards, in live chambers, or in live transformer houses	0
"F"—Contact with broken or bare live wires above ground or things rendered live through deficient insulation	2
"G"—Burnt through explosion of oil switches or fuses	3
Totals	14

These accidents occurred in connection with electric lines or apparatus at voltages ranging from 200 to 3,000. Deaths occurred with voltages as low as 200 A.C., 525 D.C., and as high as 3,000 volts A.C. The two accidents in the "A" class were due to defective insulation of cables; this had become damaged. and the periodical examinations and tests had not been sufficiently thorough to localise the defects. In one case a conviction was obtained against the resident engineer. In the single accident of the "B" class, a timberman slipped while examining the shaft and grasped two low tension lighting wires, which, however, had become charged with a much higher voltage through leakage from contact with a power line at the transformer house. Regarding the two accidents in the "C" class, one was due to the rash action of a native who climbed a power line support to try and secure a bird's nest, in spite of the fact that the pole was wrapped with barbed wire for over 4 feet of its length. In the second case a native was killed while interfering with a screen cage which guarded the junction of two cables underground carrying current at 3,000 volts. In this case it was considered that the electrician was to blame for the insufficient protection provided, but the prosecution had to be dropped owing to the absence of native witnesses. Of the four accidents in the "D" class, two were caused by the carelessness of the persons (electricians) injured, one through the slipping of a spanner with which an electrician was working on a switchboard, while in the fourth case a linesman met with his death through the carelessness of his foreman who switched current on the line without making absolutely certain that no workmen were employed on it. In the prosecution that resulted, it was considered, however, that only an "error of judgment" had been committed, and a verdict of "not guilty" was returned by the jury. Of the two accidents in the "F" class, each of which caused the death of a native, one occurred in a stamp battery where owing to vibration the insulation of a cable had become abraded, and the metal framework of a switchboard had become charged at 1,100 volts. In the other case a signal wire had broken, presumably due to lightning shock, and a loose end had coiled round a power line, escaped the cradle and reached the ground. A native sanitary boy passing in the night became entangled and was electrocuted. In the three accidents of the "G" class, there is one which is attributed to the gross carelessness of a skilled electrician who met with burns that caused his death through the blowing of the H.T. fuses of a potential transformer with which he was "playing about" quite unnecessarily and in a most foolish manner. The other two cases were due to misadventure, persons happening to be in dangerous vicinity when in one case a fuse blew in a main switchboard, while in the other case there was an explosion in an oil switch. Adopting the classification used in the reports of the Home Office of Great Britain, the following table results:—

	Accidents
1. Faults as regards the earthing of outer coverings of apparatus, switchboard frames, etc.	0
2. Contact, direct or indirect, with live parts of cables:	
(a) Direct contact with a live cable exposed through abrasion of the insulation	1
(b) Contact with a conductor (e.g. a signal wire) made live by its contact with a live cable exposed through abrasion of the insulation	2
3. Accidental contact with uninsulated live parts of apparatus:	
(a) With live parts normally exposed	2
(b) With live parts normally unexposed, but improperly exposed when live for adjustment	0
4. Misadventure	9
Totals	14

Thunderstorms on the Rand.

In the eighth annual report of the Rand Water Board, the following paragraph appears respecting electrical disturbances:—"The policy adopted in previous years, of closing down the plant during thunderstorms so as to minimise damage by lightning, has been followed during the current season. The total number of stops due to electrical disturbances during the year ending March 31st, 1913, has been 53, and the time involved amounts, in the aggregate, to 123 hours. During the previous year, the plant was only closed down on 24 occasions, and the total stoppage was 61 hours 20 minutes. The comparison referred to above shows that the storms during the last 12 months were exceptionally severe. Storms have not only been numerous, but, in several instances, they have been of unusually long duration. Six of the stops, for instance, were for periods of over seven hours each. It is usually found that the potential is much higher in dry storms than in wet ones, and this is the reason why it has been necessary to close down a greater number of times during the recent drought."

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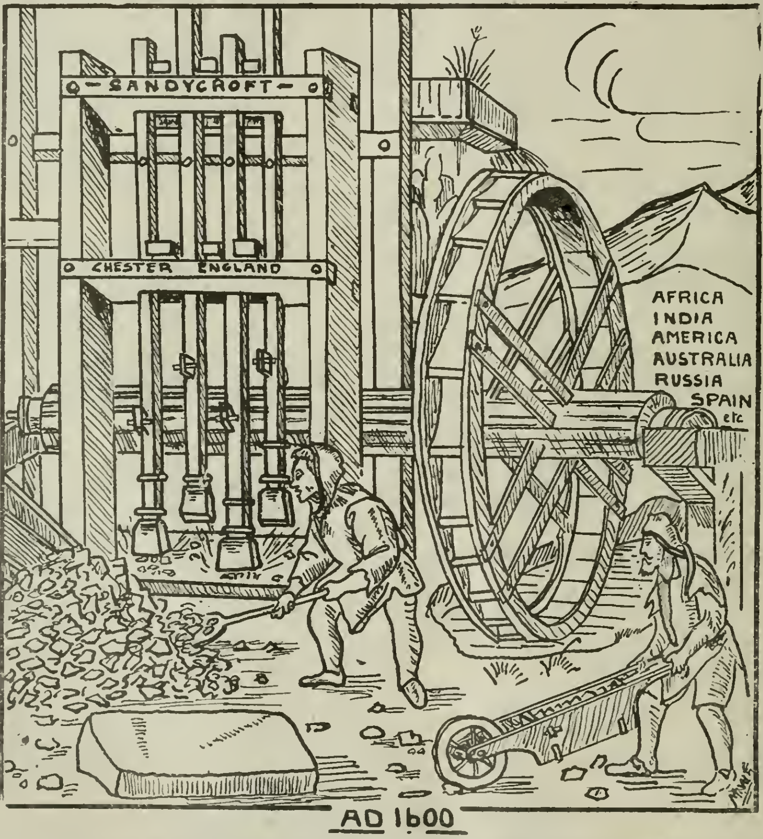

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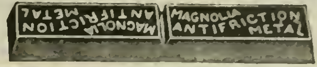

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Engineering Notes and News.

Efficiencies of Two Rand Electric Hoists.

[By J. N. BULKLEY.]*

The efficiency of electric hoists in actual practice is always a matter of interest. That of the Hecla hoist in the Cœur d'Alene was recently calculated at 41%. This figure seems low, since here on the Rand better results are being obtained. Two examples may be cited of electric hoists with which no equalizer is used. The hoist of the Cinderella Consolidated shaft has cylindro-conical drums, with diameters increasing from 10 to 20 feet. It handles a net rock-load of 10,000 lb. in a 6,500-lb. skip from a maximum depth of 4,170 feet, with a 1⅝in. rope weighing 3lb. per foot. The hoist motor was rated at 1,180 h.p., and 55 r.p.m. The design was for a maximum rope speed of 3,516 feet per minute, and the time to be occupied by a trip was calculated at 110 seconds, with 30 seconds for loading. For reasons unconnected with the hoist, only 66 per cent. of the designed speed was attained. The hoist had to handle part of the shift and material. It was in service during October, 1912, for 744 hours, so that the motor-generator was always running. During this time the power consumption was 131,130 kw.-hr., as registered by meter. As indicated by the graphic recording watt-hour meter, 115 hr. was consumed in handling men and material and the approximate energy consumption for this service as found by various tests was 5,350 kw.-hr. The number of man-trips was 840 with 30 men on the two-deck cage and the number of material trips was 170. The rock tonnage hoisted was 21,890, the number of trips was 4,432, so that the net load per skip was 9,880 lb. Of the whole number of skip loads, 4,278 came from the maximum depth of 4,170 ft., five from a depth of 3,690 ft. and 148 from a depth of 3,070 ft. This work production calculated to foot-pounds and converted to kilowatt-hours gives 68,260 kw.-hr. of useful work done in the shaft. The work per trip was therefore 15·4 kw.-hr.

USEFUL WORK OF MEYER AND CHARLTON INCLINED SHAFT HOIST.

Vertical Depth in feet.	No. of Skips.	Tonnage.	Useful Work done in hp hr
340	50	225	66·2
560	88	396	24
630	11	50	31
704	120	540	384
900	57	256	233
1,100	42	189	210
1,175	648	2,918	3,465
1.270	541	2.435	3,130
1,437	521	2,346	3,405
1,535	1,333	6,002	9,300
1,437	8	36	52
1,437	89	400	581
Total	3,508	15,793	21,081·2

Deducting the time consumed in man and material service the time occupied in rock hoisting was 629 hr., and in the same way the power consumption was 125,780 kw.-hr. The average duration of a trip as indicated by tachograph was 165 sec. Hence the whole number of rock trips occupied 203 hr. of actual running time, and for 426 hr. the motor-generator ran light. The energy consumption while running light was 49 kw.-hr. per hr., including excitation of hoist motor. Hence the wasted energy was 20,874 kw.-hr. Deducting this loss, the actual energy consumption in rock hoisting was 104.906 kilowatt-hours. The number of rock trips made per hour was 4,431 divided by 629, or 7·05; the hoist was designed for 25·7 trips per hour; hence the load factor was only 27·5 per cent. The efficiency, including losses when the motor-generator was running light, was 68,260 kw.-hr. output, divided by 125,780 kw.-hr. input, or 54·2 per cent. With a 100 per cent. load factor, which would eliminate the motor-generator losses while running light, the efficiency would be 68,260 kw.-hr., divided by 104,906, or 65 per cent. Since the copper losses of the hoist motor and generator are the principal losses, it is safe to say that the overall efficiency of the plant would be still further increased; if the duration of a trip were reduced to the calculated figure of 110 seconds. The incline shaft of the Meyer and Charlton Gold Mining Co., Ltd., has a dip of 42 deg. 28 min. for 746 ft. from the collar, of 33 deg. 47 min. for the next 360 ft., of 34 deg. 50 min. for the next 385 ft., of 32 deg. 43 min. for the next 171 ft., and of 27 deg. 10 min. to the boundary. The hoist is of the Ward-Leonard type, has drums 3 ft. 8 in. by 10 ft., hoists an average net rock load of 9,000 lb., though designed for 10,000 lb., in a 7,000-lb. skip with a 1⅛-in..rope weighing 2·55 lb. per ft. The maximum rope speed is 2,000 ft. per min. The man cages run at 1,000 ft. per min. and carry 30 men. The hoist motor is rated at 452 h.p. and 64 r.p.m. During August, 1912, the total energy consumption was 33,900 kw.-hr. During this period, 1,020 man trips were made and 108 material trips and 15,793 tons were hoisted, while 900 short trips were made in the changing levels. The average hoisting depth was about 1,320 ft. The distribution of the tonnage by levels is shown in the table. Calculated on the basis of the total energy input for all service and the useful work done, the efficiency is obtained by multiplying 21,081 by 0·746, and dividing by 33,900. It comes out 46·5 per cent. The efficiency of the hoist, while engaged in handling rock only, would, of course, be much higher.

The Driving of Fans by Three-Phase Cascade Motors.

Zederbohm in *Glückauf* describes a fan installation at the Werne Colliery, in which a fan under 300 mm. water-gauge and running at 250 revolutions per minute, is designed to deliver variable volumes of air up to 11,000 cubic metres. This variation is secured by employing a cascade motor with four different speeds. The motor is coupled in the ratio of 1 : 1 to an auxiliary motor, the main motor having a capacity of 1,200 horse-power and a speed of 247 revolutions per minute, and 24 poles (with a frequency of 50). It is furnished with a slip-ring rotor. The stator of the auxiliary motor has two *enroulements*, of which one has eight poles and the other eight poles, which can be modified to one *enroulement* with two poles. Each of these windings is coupled with the three slip-rings of the main motor. By this means four different speeds of 250, 231, 214 and 188 revolutions per minute are obtainable. Trials have been carried out by the Dortmund Boiler Inspection Association, which may be briefly set out as follows :—

	1.	2.	3.	4.
Fan revolutions	186	212	231	248
Water-gauge (mm.)	148	198	226	260
Volume of air (cubic metres per minute)	8,421	9,786	10,353	11,288
Equivalent orifice (square metres)	4.37	4.39	4.37	4.44
Work of fan (horse-power)	277	430.6	520	652.2
Power supplied to fan (horse-power)	393	586	735	906
Yield of fan (per cent.)	70.5	73.5	70.8	71.9
Power supplied to motor (horse-power)	439	652	804	901
Total yield (per cent.)	63.1	66.4	64.7	67.9

Further variations may be obtained by changing the ratio between the main and auxiliary motor.

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*Consulting electrical engineer, General Mining and Finance Corporation, Ltd., Johannesburg, South Africa, in *The Engineering and Mining Journal.*

Resuscitation from Electric Shock.

The report of a Commission on resuscitation from electric shock to the N.E.L.A. Convention stated that, so far as the amount of ventilation of the lungs was concerned, the Schaefer method, reinforced by the extension of the arms forward, was decidedly better than that suggested by Silvester. This advantage, taken in conjunction with its greater simplicity and safety, caused the Commission to vote unanimously in favour of the prone-pressure method of artificial respiration as an effective means of giving immediate aid. A booklet on resuscitation has been prepared as the outcome of the work. Even a relatively poor method of artificial respiration, if begun immediately, may maintain life and permit ultimate recovery in cases in which an ideal method, with all the resources of the laboratory and hospital, would be ineffective after a few minutes. The Committee emphasised the wide publicity which the "pulmotor" had received through the daily Press, but pointed out that the pulmotor had lacked scientific, surgical and medical sponsors. Efforts to obtain scientific details and other reliable information bearing upon specific cases in which the pulmotor had been used, led to the conclusion that the cases available to the Committee did not furnish convincing proof of the necessity or exceptional value of this apparatus. The report described the mechanical method of artificial respiration used by Dr. Metzler, which has commendable features. The Commission recommended this apparatus as a satisfactory means of continuing artificial respiration, and suggested that in cases of suspended breathing the modified prone-pressure method be supplemented as soon as possible by the use of the apparatus.—*Electrical World.*

New S.A. Companies Registered in London.

AFRICAN DIAMOND DEVELOPMENT COMPANY. LTD.

The African Diamond Development Company, Ltd., was registered on July 23 with a capital of £125,000 in 5s. shares. The objects are to carry on the business of dealers in diamonds and other precious stones, gold, silver, copper, tin and other minerals; miners, explorers, etc., in Africa or elsewhere; and to adopt an agreement with the African Finance Company, Ltd. The minimum cash subscription is seven shares. The first directors (to number not less than two nor more than nine) are: Earl Russell, Telegraph House, Chichester; P. F. Haupt, M.S.M.D., P.H.D., 73 Cheapside, London, E.C.; Captain E. C. H. Kennard, 100-101 Finsbury Pavement House, London, E.C. (Director London Committee, W. Lane & Co., Ltd., Port Elizabeth, Cert. R.S.M., 1901), and Commander J. O. Hatcher, R.N., Colegate, Horsham. The qualification is 100 shares and the remuneration £100 each per annum (chairman £150), free of income-tax, and 5 per cent. of the surplus net profits in excess of 10 per cent., divisible.

MOZAMBIQUE-MASSINGER RUBBER AND PRODUCE ESTATES.

Registered July 26. Capital, £37,500 (50,000 10s. preference and 50,000 5s. ordinary). Objects: To take on option, lease or otherwise acquire lands and properties in any part of the world suitable for the cultivation of cocoanuts, cohune nuts, rubber, tea, coffee, timber and other produce, or for the production of oil or minerals, etc. Minimum subscription, 200 participating preference shares. Registered office: Finsbury House, London, E.C.

The Union Treasury receipts for July on revenue account were £1,284,643, and for the four months from April 1, £4,855,900, as against £4,934,218 in 1912.

The Modderfontein Deep Levels,
LIMITED.

(Registered under the Limited Liability Laws of the Transvaal.)

Closing of Register of Members.

NOTICE is hereby given that the Register of Members of the above-named Company will be closed from the 26th AUGUST to the 2nd SEPTEMBER, 1913, both days inclusive.

By Order of the Board,
C. L. CHALMERS,
Secretary.

P.O. Box 1125,
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25th August, 1913.

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Will show a saving of 75% in Oil, and give a more efficient Lubrication.
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Finance, Commerce, and Industries.

Natal Coal Combine.

Natal coal mine owners have protested to the Administration against the new rates on coal to Capetown, which come into force on October 1, declaring that they are tantamount to a preference being established in favour of Transvaal coal, whilst the diversion of rolling stock to the longer route adds further to the loss of the Natal collieries, as it will intensify the shortage of rolling stock.

* * * *

Building Activity.

The following are the estimated values of buildings, the plans of which have been approved by undermentioned Municipal Councils for the month of July, 1913:—Johannesburg, £93,894; Benoni, £2,740; Boksburg, £4,795; Germiston, £3,600; Krugersdorp, £4,269; Pretoria, £6,464; Roodepoort, £1,350; Springs, £725; Capetown, £11,820; Claremont, £990; Wynberg, £50; Simonstown, £300; East London, £3,714; Queenstown, £700; Durban, £9,227; Bloemfontein, £7,615; total, £152,253. Tenders accepted by Government for public buildings during the month, and not included in the above amount, £74,249 11s. 11d.

* * * *

H.M. Trade Commissioner's Report.

Sir Sothern Holland, His Majesty's Trade Commissioner for South Africa, in the course of his annual report to the Board of Trade, says:—"The weak feature of the economic position in South Africa is the extent to which prosperity is dependent on the mining industry. But the resources in this respect are so vast that there need be no misgivings so long as nothing is done to hamper the operations of the mining industry and the inflow of the necessary capital, without which it would immediately suffer. It is satisfactory to note that the exports of non-mineral South African products are steadily increasing in value." Mr. Holland draws attention to the increase in the tonnage of South African produce carried by the Union Railways as showing that development is proceeding at a greater pace than is generally realised, and that the purchasing capacity of the people is increasing, while the expenditure on certain classes of goods contains remarkable figures, showing how the comparative wealth of the people is increasing. In discussing the importance of South Africa as a market for British goods, Mr. Holland emphasises the stability of British trade, and says:—" The figures give every reason for satisfaction, although I have no desire to belittle the danger threatening us from foreign countries." Mr. Holland attaches greater importance to American competition than to German. He refers to the success of British firms over American in farm traction. The competition at Port Elizabeth, he says, of mechanical traction is destined to play a great part in the development of South Africa. This competition deserves special mention as illustrating the enterprise of British firms. " South Africa is steadily proceeding on the road to progress and expansion, while Britain maintains her hold upon the market."

* * * *

The New Shipping Rates.

Several interesting points affecting commerce came under discussion at the meeting of the Durban Chamber of Commerce last week. The Chairman, in his speech moving the adoption of the Committee's report, referred to the revised rates of steamship freight which had been carefully tabulated by the secretary of the South African Merchants' Committee in London. There are no fewer than 1,049 different rates, and out of these 812 have been increased to the full limit of 15 per cent., laid down as permissible in the agreement with the Conference lines, which most of the merchants have signed. In his remarks, Mr. Buchanan said: " This must at no distant date have the effect of somewhat increasing the cost of living throughout the Union, which was much to be deplored, more especially as they were led to believe by the Government that by the abolition of the rebate system and the possibility of an open freight market the reverse would be the case."

* * * *

Merchants in South-West Africa.

A Consular report on the trade of German South-West Africa contains the following remarks by the Swakopmund Association of Merchants:—" The year 1912 was an unsatisfactory one for the merchants. The considerable decrease in imports is attributable partially to the completion of railway construction, but principally to the extraordinary scarcity of money. The turnover clearly shows that the requirements of customers are becoming restricted more and more to absolute necessities. The consequence of the extraordinary scarcity of money referred to has been to force the merchant into a rôle which he should not really fill, and which is outside the true scope of his business. Instead of achieving his object of turning over his capital rapidly in order to be able to sell cheaply, a bad state of affairs has arisen in which the capital of the merchants is locked up and diverted from employment in the proper manner. With prices unsatisfactory to start with, such long credits are demanded that in many cases the nature of the merchants' business is perverted and compelled to take the place of a mortgage bank in order to save money invested from being lost." " The position is simply this," states the British Consul, " that the majority of farmers are deeply indebted to the merchants. When they have slaughtered stock to sell, the merchants to whom they owe money take it over at a nominal price, with which their accounts are credited. During 1912 outstandings have not been reduced, and in many cases, in spite of all efforts to restrict advances, it has been found necessary to give increased credits in order to keep the farmer going in the hope that better times will come and enable him to settle his account. It is now certain that a land credit bank will soon be started in order to supply farmers with capital with which to effect improvements in farm and stock. The effect will be to relieve the tightness of money, and it is expected that farming prospects will look more rosy than they do at present."

New Boksburg Gold Mines, Limited.

(INCORPORATED IN THE TRANSVAAL.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Thirteenth Ordinary General Meeting of Shareholders in the above-named Company will be held in the Board Room, Fourth Floor, National Bank Buildings, Simmonds Street, Johannesburg, on WEDNESDAY, the 5th day of NOVEMBER, 1913, at 11 a.m., for the following purposes:—

(1) To receive and consider the Statement of Account and the Reports of the Directors and the Auditors for the year ended 30th June, 1913.

(2) To confirm the appointment of Mr E. H. Read as a Director of the Company in place of Mr. Geo. R. Airth, resigned.

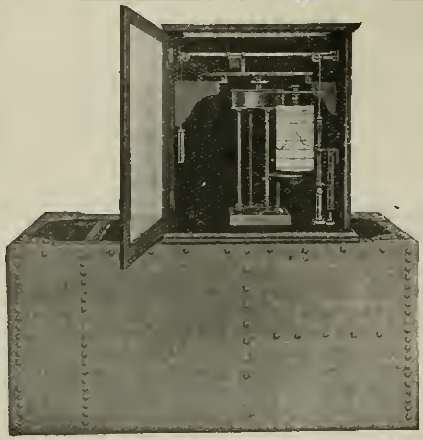
(3) To elect two Directors in place of Messrs. Wm. Dalrymple and G. W. Higgins, who retire in terms of the Company's Articles of Association, but, being eligible, offer themselves for re-election.

(4) To appoint Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors, Messrs. C. L. Andersson & Company, and Mr. T. R. Haddon.

(5) To transact all such other business as may, under the Articles of Association, be transacted at an Ordinary General Meeting.

By Order of the Board.
L. S. RAYMOND,
Secretary.

Head Office:
3rd Floor, National Bank Buildings,
Simmonds Street, Johannesburg (P.O. Box 1083).
27th August, 1913.



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The most obvious of its many uses are as follows :

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4. Measurement of CYANIDE, Oil, Acid or Alkali liquors.
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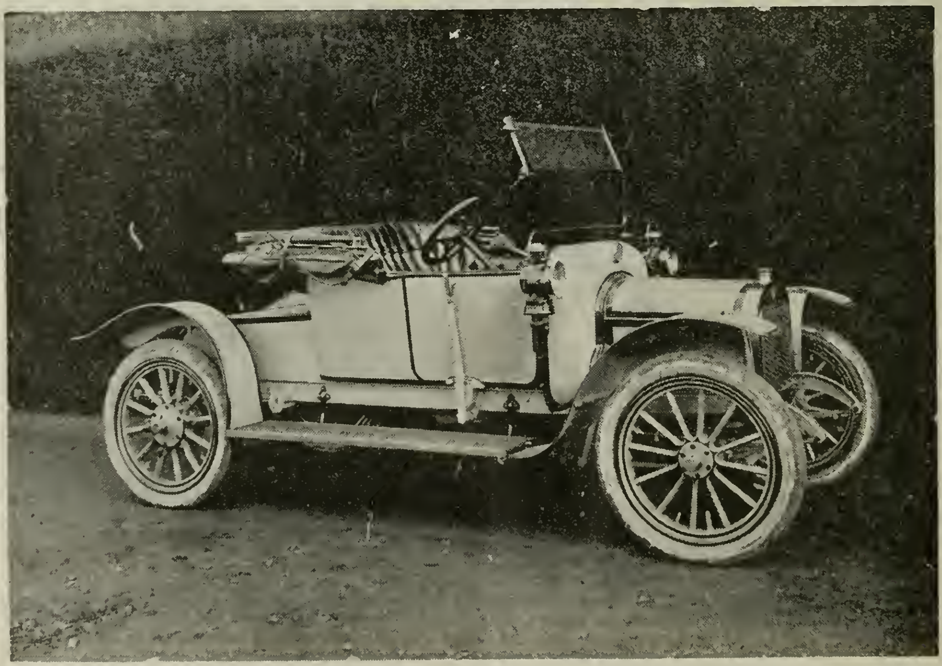


Particulars from **GILL'S GARAGE, Eloff Street, JOHANNESBURG.**

P.O. Box 4659. 'Phone 1505.

Automobile Notes.

The members of the African Motor Expedition were the guests of the Royal Automobile Club of South Africa at a luncheon given by the committee, at which the Mayor of Capetown was present. The departure of the expedition has been postponed for a week owing to the non-arrival of the car by last mail steamer.

* * * *

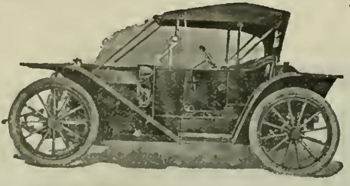
One of the surprises of the Grand Prix race in Picardy, in which the Sunbeam again so conspicuously upheld the honour of British manufacture, was the large percentage of petrol found remaining in the tanks of all the cars that finished. Tyres are also said to have behaved well on all hands, particularly Dunlops and Pirellis.

* * * *

The holding-up of motor cars by highwaymen on the Continent is by no means infrequent. One of the methods adopted is to stretch a wire across the road in lonely places on the highway, or when passing through forests, at a height to take a man in the neck. An inventor, M. Makrinus, has invented a metal arrangement, which can be affixed to the car in dangerous localities, and which catches and lifts the wire over the car when encountered.

* * * *

The Petrol Substitutes Joint Committee, which is composed of representatives of the Royal Automobile Club, the Society of Motor Manufacturers and Traders, and the Automobile Association and Motor Union, visited the Frankett Works at Acton recently for the purpose of inspecting a special plant for the treatment of peat, under a process invented by Herr Franke, one of the chief by-products of which is motor spirit. The members of the Committee also had a short run in a Fiat car driven on the motor spirit thus obtained.



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4 Cylinder, 25/30 h.p., BOSCH MAGNETO, ZENITH CARBURETTOR, 3 Speeds and reverse. Gate Change. Full Equipment, hood, screen, 5 Lamps, 5 detachable rims. 5 SEATER, £270. 2 SEATER TORPEDO, £265
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Notice to Motorists.

¶ Economies in manufacture due to production upon a huge scale—purchases of material upon a scale correspondingly large—these facts enable the Wood-Milne Company once again to announce important price reductions.

¶ The efficient modern motor that runs on Wood-Milne Tyres gives maximum pleasure for minimum expense.—Write for the new Wood-Milne Price List.

¶ "Wood-Milnes" are the tyres for the rough roads because "Wood-Milnes" are the strongest tyres ever made.

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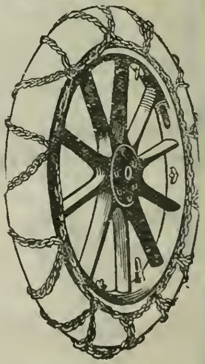

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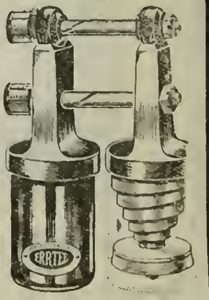

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